ARCHAEOLOGICAL RESEARCH SERVICES, INC.
ASSOCIATES FOR CULTURAL RESOURCE STUDIES

ARCHAEOLOGICAL EVALUATION OF THE CARSON RIVER MERCURY SITE AT DAYTON AND SILVER CITY, NEVADA

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TABLE OF CONTENTS

LIST OF FIGURES

(Located at end of report)

INTRODUCTION

This report documents archaeological testing and recording undertaken by Archaeological Research Services, Inc. (ARS) at three locations (MS001 North, MS001 South, and MS030 as defined on E&E maps provided to ARS) in Dayton and Silver City at the request of E & E. Study areas MS001 North and MS001 South are adjoining parcels at the south end of Dayton next to the Carson River (Figure 1). Study area MS030 is in American Ravine just southwest of Silver City (Figure 2).

The purpose of our study is threefold. First, it is to document surface archaeological remains of the three archaeological sites (894-1, 894-2, and 894-3) on standard Intermountain Antiquities Computer System (IMACS) forms and test for the possibility of archaeological deposits within the zone planned for subsurface ground disturbance as part of the Carson River Mercury Site remediation project. Second, this information is used to make recommendations about the significance of these sites in relation to criteria for inclusion in the *National Register of Historic Places* as mandated by Section 106 of the National Historic Preservation Act and implementing regulations. Third, recommendations for the management of these sites are offered based on site content and significance. This approach to cultural resources on the Comstock conforms to standard procedures in Nevada and to recommendations made specifically for highly sensitive historical areas of the Comstock made by Reno (1990). The lead agency for this project is the Environmental Protection Agency (EPA). We anticipate that the chief reviewer of the technical content of this document will be the Nevada State Historic Preservation Office (SHPO). Although every effort has been made to keep this document as short as possible, enough material on methods and supporting data has to be included in text and the appended site forms (Appendix A) to allow these agencies to judge the appropriateness of our conclusions and recommendations. At the conclusion of consultations a copy of this report and site forms should be forwarded to the Nevada State Museum, Carson City for inclusion in the regional archaeological data repository.

METHODS

All work was designed to be performed in accordance with the subcontract agreement and the specifications set forth in the scope of work provided to ARS by E & E.

Prefield work included development of a site-specific safety plan designed to meet general criteria in the E & E safety plan as amended along with alterations required by archaeological work. This plan is included as Appendix C. Prefield literature consultation included a preliminary archaeological reconnaissance of the parcels made by me earlier (Memorandum to Mary Ann Wright, April 2, 1996), the *Final Title Reports of the Comstock Mills at Carson River Mercury Site* (SAIC 1993), specific maps and plats of the study area from the Lyon County Courthouse and the BLM State Office, and contextual information about the

named mills available at other local repositories. Records of previous archaeological research were consulted at the Nevada State Museum.

I visited MS001 and MS030 on October 30 to contact Debbie Webber (the tenant at 170 Railroad Street) and Don Works. Archaeological fieldwork was conducted on November 4-8 and 11-15, 1996 by a crew of three to four archaeologists (Reno, Clay, Larry Hause, Tom Burke) supplemented by a backhoe operator (Tennant Construction). Special attention was given to avoiding possible mercury contamination of workers or the general site area. Although the procedures were simple by hazardous materials standards, they made fieldwork much more difficult and time-consuming than it would have been in normal circumstances.

Machine excavation by a backhoe and operator provided by Tenant Construction under the supervision of an archaeologist was done in the two known features at MS001 North. Two additional field workers kept the excavations sprayed for dust suppression to reduce danger of mercury poisoning. Four trenches (TR1 to TR4) were excavated to a maximum depth of 4 ft. Exposed strata were drawn, photographed, and described by the two trained geoarchaeologists on the team. Texture descriptions are not as accurate as usual due to the decision to handle the sediments with latex gloves. Artifacts and features were described as well. A layer of plastic was spread on the bottom of each trench, which was then backfilled by the backhoe.

[redacted] artifacts [redacted] Artifact bags [redacted] North [redacted] shown to the landowner [redacted] recommendation [redacted] Historical Society.

Site recording on IMACS forms was confined to the parcels where we were granted access by the landowners. Surficial artifacts and features, backhoe trenches, and hand-dug units were plotted on base maps provided by E & E. Site locations were plotted on USGS 7.5' maps.

SITE DESCRIPTIONS

MS001 NORTH (Dayton, SE¼ NW¼ SE¼ Sec. 23, T.16N R.21E, USGS Dayton 7.5')

This parcel is located on an alluvial terrace adjacent to the Carson River. It comprises the back yards of several houses along Railroad Street. Remains of a quartz mill and artifact scatter were recorded as Site 894-1. Remains of the Rock Point Ditch were recorded as Site 894-2.

Soils mapped along that portion of the Carson River in the study area include Fallon fine sandy loam along the floodplain representing generally fine-grained overbank deposits and Veta very gravelly sandy loam on the first terrace west of the floodplain, originating as alluvial fan gravels emanating from Gold Canyon onto the Carson River floodplain (Archer 1984: Sheet No. 10). Fallon soils are characterized by an upper 25 cm thick pale brown, fine sandy loam over a 125 cm thick, light brownish gray loam, silt loam, fine sandy loam, loamy sand, and sand. The seasonal water table extends from 1-1.5 m below surface, and this soil floods frequently between March and November annually (Archer 1984:45). These soils comprise the majority of the project area. Veta soils are typically light brownish gray very gravelly sandy loam in the upper 15 cm and pale brown extremely gravel loam to 30 cm below surface; from 30 cm to 150 cm the soil is light brownish gray and light gray very gravelly sandy loam and gravelly coarse sandy loam. Remnants of both soils were found in project excavations as were a number of industrial and redeposited cultural sediments. Clearly, the location of this millsite on a very active floodplain, adjacent a water source necessary for the milling process, with continual modifications to both the milling technologies and water containment, channels, ditches, etc., makes the stratigraphic and surficial descriptions both interesting and complex. Both the natural and cultural environments at this millsite are so dynamic the presence of anything related to the mill seems, given floods and land modifications, a consequence of luck. Descriptions of the internal nature of the mound and ditch are provided below.

Site 894-1 Keller & Co. Mill

Historic Context

As part of the SAIC study, Piedmont Engineering Co. resurveyed millsite boundaries and relocated prominent cultural features. This parcel is entirely within the Keller & Co. Millsite, also known as the Lindauer & Hirschman Quartz Mill and the Sweetapple Mill. The stamp mill, powered by steam and water, was built in 1861 and dismantled in 1866 (SAIC 1993[1]:56, 59).

The Keller & Co. Mill was owned by Joseph Keller and Isaac Cohen. These were two of Dayton's staunchest citizens whose primary business was the Old Pioneer Log Store (Kelly 1862:213, 219). The tiny mill is described as follows by Kelly (1862:219):

> KELLER & CO'S MILL—situated on the west side of the river, a few hundred yards below the Aurora, is sixty by seventy-five feet in extent; runs five stamps, and four arrastras, crushing about twenty tons of rock per day. It is driven by a center-discharge wheel, employs eight hands, and works the ore for both gold and silver.

Based on the tonnage five stamps could crush at other mills in the area at a slightly later date, it is likely that this mill was actually processing somewhere between three and eight tons daily. The mill is shown under the Keller & Co. name on Bancroft's 1862 map (Ansari 1989:83).

The millsite was surveyed on November 20, 1862 for Abram Lindauer, Moses Hirschman [also spelled Hirshman], and Henry Sweetapple (Surveys A:209). This plat, included with the 894-1 site form, shows a single rectangular mill building adjacent to a dam across the Carson River. The mill race runs along the southeast side of the building. An 1863 survey for a nearby mill confirms this general layout (Surveys A:298). This survey was undertaken to facilitate a transfer of title on November 28 to Lindauer and Hirshman of Gold Hill by the original owners, Keller, his wife Rosalla, and Cohen for $13,000 (Deeds A:551).

Lindauer sold "one half of two fifths" share of the Keller & Co. mill and other assets on the Comstock to Hirschman on December 8, 1862 for $10,000 (Deeds A:646). On February 26, 1864 Hirshman sold an undivided one-fifth part of the mill to Henry Sweetapple for $5000 (Deeds C:373). Hirschman sold a further two-fifths of the property to A. Block of San Francisco for $10,000 on September 13, 1864 (Deeds D:195). Lindauer sold his remaining share of the mill "formerly known as the 'Keller Mill' and now known as the 'Lindauer and Hirschman' Mill" along with the land to Lewis Gerstle, also of San Francisco, for $19,000 on October 7, 1865. Block and Gerstle appear to be speculators not interested in directly running the mill.

The 1865 township survey plat with 1865 revisions shows the Sweetapple Mill in the correct location to be in the study area. The mill site was referred to under Sweetapple's name (sometimes corrupted to Sweet Apple) on later maps. Butler and Ives' (1865 v.R13, Fiche 6:367) survey notes include bearings from section corners that confirm this location when plotted on a modern map.

Sweetapple made a profit in October 17, 1865 when he sold his one-fifth share to the Imperial Silver Mining Company of California for $12,000 (Deeds D:843). On October 27, Block sold his 2/5 share for $24,000 (Deeds D:840). The same day Imperial purchased the final 2/5 share from Lewis Gerstle for an additional $24,000, thus obtaining complete control of the property (Deeds D:838). The SAIC title search indicates a break in the chain of title at this point. It is not known what the Imperial Silver Mining Company did with the property after the mill was dismantled. For later title history refer to the SAIC document.

Ansari (1989:83) discusses the Lindauer & Co. Mill:

> Reported in 1865 to be water-powered, to have 15 stamps and 10 pans, to burn one cord of wood per week, to employ 9 men, and to crush 20 tons a day from the Gold Hill Consolidated Mine [data from the 1865 report of the Surveyor General]. At that time Lindauer, Hirshman, and Sweetapple were proprietors. It was also known as the Lindauer & Hirshman Mill. In 1866 the *Territorial Enterprise* reported it to be operating exclusively as a tailings mill, getting much of its supply of tailings from the Rock Point Mill.

In 1865-1866 the Nevada State Mineralogist (Nevada State Legislature 1877:149) collected data on the Lindauer & Co. mill just before it was dismantled by the end of 1866. It had been extensively remodeled since 1861 if not entirely rebuilt. The mineralogist notes that it could crush up to 20 tons daily with its 15 stamps totaling 480 pounds. The arrastras were replaced by 10 Wheeler amalgamation pans. Wheeler pans were flat-bottomed and were one of the more popular of the many pan styles available during this period of rapid development in pan technology. The mill was powered by a combination of steam and water, consuming 2 ½ cords of wood daily. These statistics indicate that it was an average Comstock pan mill of this early period characterized by a multitude of small mills.

An 1885 map shows no buildings at the Sweetapple mill site, and the dam is no longer in evidence, although the Carson River is extremely wide in this area (Map in evidence for Third District Court, Lyon County, Nevada, Luigi Casei et al. vs. C. C. Stevenson, on file in Clerk's office). Evidently the dam had washed out, leaving the main channel of the Carson River flowing right over the former mill and tailrace.

The 1905 assessor's map of Dayton extends into the study area. This map shows the railroad yard and houses for the Nevada and California (formerly Carson and Colorado) railroad that was active from 1880 to 1934. It also shows the alignment of the Rock Point Ditch. These locations are shown better on the 1909 map and are discussed below. The mill seat is identified as the "Sweet Apple Mill Site" under control of the Union M. & M. Co.

On the 1909 Dayton Map the area currently occupied by houses and backlots was the site of the Southern Pacific Railroad Yard. Residences of the railroad agent and the section foreman occupied the rear of the yard while a small depot was adjacent to the right-of-way in what is now Railroad Street. The Rock Point Mill Race corresponds to its presently discernable location. A photograph of the MS001 area taken about this time clearly shows the railroad yard improvements (reproduced in Reno 1989:33). Several landscape features appear in this photo. A sagebrush covered mound is present behind the railroad residences, situated approximately halfway between the back sheds and the river. This mound may well be the one (Site 894-1 Feature 1) bisected by TR1 and TR2 during our recent testing activities as its shape, an unevenly truncated pyramid with highpoint at the downstream edge, and location, closely resemble the

trenched mound (Figure 3). The mound is located just west of the active channel of the Carson River and just downstream from an oxbow in the river that served as the reservoir for the expanded Rock Point Mill Race. This oxbow was later buried during leveling of a field. During floods or above average runoff this mound would be subjected to the most intense erosive power along its eastern and southern edges. Major floods on the Carson River have been recorded in 1861-2 (washing away a number of mills), 1867, 1871-2, 1907, 1937, 1955, and 1986 (Dangberg 1975:18-21, 347; Pupacko et al. 1990). A ditch may be present in the photograph extending from the eastern edge of the sagebrush-covered point bar to the inside of the aforementioned berm, although no ditches are clearly indicated. Also notable is the light coloring of the surficial sediments in the sagebrush covered area north of the meander and south of the railroad residences. This material strongly resembles mill tailings located just west of the railroad tracks and may represent outwash and/or flood water redeposition of some of this material in the project area. A gravel accumulation along the north central bank of the meander appears cultural in origin and may be related to the ditch, to a ford in the river, or to bank stabilization on the cutting edge of the meander channel. Thus by the timing of this photograph, the project millsite is not present although the current Feature 1 mound appears present and covered with sagebrush. Additionally, the ditch does not appear to be in use or visible from the early twentieth century photograph. No dwellings are present in the area and the cottonwoods cut out earlier for firewood have not grown back. By contrast, from the same vantage as the historic photograph the study area is almost entirely obscured by cottonwoods.

Physical Remains

No definite surface remains of the mill were evident, but a mound on site (Feature 1 or F1) with many boulders and cobbles appeared likely to be part of a structure. A low possible rock alignment on the southwest side of the mound was identified as Feature 2. Feature 3 is a concentration of extremely fragmented artifacts including a mix of boom-period items (black glass bottles, extremely patinated brown and aqua glass), more generic ninteenth century markers such as applied and tooled finishes on bottles, cut nails, and undecorated improved white earthenware (IWE). Late ninteenth to early twentieth century glass is present, including a purple picnic flask. Debris continues to present. Overall, ground visibility is extremely poor. Where the dense growth of weeds has been scraped off, this scatter of fragmentary artifacts tends to be exposed. Feature 4 is a concentration of ninteenth century domestic artifact fragments exposed by partial excavation of the ditch berm of Site 894-2 for use as a borrow pit. None of these surface artifacts are particularly mill-related, suggesting instead generic domestic discard and architecture. This pattern of artifacts extends into the southern end of the site, within MS001 South discussed below.

Two backhoe trenches (TR1 and TR2) and three excavation units (EU1-3) were placed within a mound thought by Piedmont Engineering to correspond to the historically mapped location of the historic Keller & Co. Mill. The 1862 survey map reproduced in the site form suggests that a single rectangular building with long axis oriented roughly northeast-southwest

comprised the quartz mill. TR1 extends for 12 m at 10 degrees along the length of the mound from a central apex to an apparent lower edge to the south. EU3 was excavated in the west wall of this trench at a location where an area of charred debris looked like possible in situ structural remains. TR2 begins at the north end of TR1 extending at a 75 degree bearing for 11.5 m and exposing the river-side of the mound. Within TR2, one area of structural debris was chosen for the excavation of EU2. EU1 was placed in an area located on a slight rise off the southern edge of the mound in an area with several rock alignments on the surface (Feature 2). Location of units and trenches with regard to the mapped millsite in 1862 would place TR1 extending from somewhere in the center towards the southeastern wall; TR2 would extend from the apex through the northeast wall to the Tail Race. EU1 would be near the juncture of the southwest and southeast edges of the mill. However, it should be noted that an overlay of the 1862 plat places most of the mill in the present river and places the mound immediately southwest of the building.

Depositional history of the mound (F1) is illustrated and described in detail on Figure 4. Briefly, and working from the past to present within the context of 4-ft-deep maximum exposures, major strata and stratigraphic breaks suggest the following scenario. An existing or humanmade terrace rising to a maximum of about 1.5 m above the surrounding floodplain and comprised of strata 14, 14A, 14B, and Stratum 4 in EU1 formed a flat topped surface (Interface 13) for use by local millers. These strata are primarily devoid of cultural artifacts although some have mixed into the upper levels of the softer alluvial sediments. All of these strata represent either overbank or active alluvial channel deposits as expected along the edge of the Carson River. These strata are encountered near or below the base of TR1 and TR2, and in the lower levels of EU1.

It appears that the lower edges of this flat-topped terrace may have been stabilized against the Carson River floodwaters by placement of boulder riprap such as that found in EU1 (resting on Stratum 3) and in F1-4 (Stratum 12) near the center of TR2. A bottle fragment in Stratum 12 pre-dates the 1870s. Conversely, these boulders could have been deposited during very high energy floods along the flanks of a high terrace remnant. Just inside the riprap zone and above the terrace top are several notable strata. In the southern part of TR1, Stratum 11 represents a mangle of intensely burned metal, glass, and cut nail fragments in a white ash, charcoal, and clinker/cinder/slag matrix, ranging from indurated to soft consistency. Lack of fire-reddening, oxidation, or hardening of sediments above or below this deposit suggests that the stratum was not burned in situ but moved to this location after its encounter with an intensely hot conflagration elsewhere. Mill-related artifacts include quartz ore fragments, copper plate fragments (normally used for amalgamation plates), and fragments of a carboy (used for industrial reagents such as nitric acid). The carboy fragments crossmend with other fragments on the underlying surface of Stratum 13.

In TR2, strata 7, 8, and 8A appear to contain fragments of wood and debris that may be related to early millsite use and all directly rest on the apparent flanks of the underlying terrace. The nature of the sediment matrix in these strata closely resembles that of the underlying fine-

grained overbank deposits in Stratum 14 with the addition of cultural material. Only strata 8 and 8A have evidence of light colored, fine grained mill tailings. Interestingly, in these strata and along their underlying interface with culturally sterile deposits there is no evidence for millsite foundations within the trenches and units excavated, as one would expect if the mill was actually located here.

Next are several strata that appear deposited in place and to be relatively undisturbed by floodwater or cultural demolition processes. Stratum 10 appears to be a human-made berm on the south edge of TR1 above Stratum 11; this stratum is similar in character to the fine-grained overbank deposits, although cultural material similar to that of Stratum 11 is present. This berm appears to contain strata 6 and 6A, both water lain, horizontally bedded, fine grain silt and sand deposits suspected to be mill tailings. Stratum 6A extends across most of the TR1 and TR2 exposures averaging 10 cm in thickness, while Stratum 6 averages 25 cm thick but occurs only on the central portion of TR1, being cut on the north by F1-2, an apparent hole or pit cross-cutting this stratum. Artifact cross-mends and morphology indicate that both Strata 6 and 6A are about coterminous with Stratum 11. This is not surprising since all rest on different portions of the Stratum 13 interface.

Above the stratified deposits, a thick (averaging 50 cm) massive jumble (Stratum 5) of boulders, wood (up to 12 x 12 inch section), brick, and mortar structural debris; millsite (arrastra boulders, amalgamation pan muller) and domestic artifacts; barrel fragments; and disoriented clasts of mill tailings similar to those in underlying 6 and 6A strata cover most of the flat-topped terrace except within the F1-2 area where a similar stratum, 2, occurs. This deposit may be the result of one or more processes including mechanical redeposition of primarily millsite debris and rubble from somewhere off the mound with subsequent floodwater reworking of deposits; or in situ mechanical demolition and floodwater reworking of a millsite built above stratified mill tailings (which may be unlikely given the soft nature of these deposits).

A detailed analysis was done of the arcs scored in the upper surface of the two boulders that were from the pavements of one or two of the arrastras. One of the stones indicates a minimum diameter of about 8 ½ ft while the other suggests a minimum diameter of 7 ½ ft. The arrastras may have been larger, since it is unlikely that we have the outermost stones. By comparison, an intact arrastra from Arizona was about 11 ft in diameter (Kelly and Kelly 1983).

Stratum 2 in F1-2 is identical in nature to Stratum 5 but may have more tailings inclusions in near horizontal context. Feature 1-2 appears to be a man-made cut and fill feature near the apex of the mound. The base of this feature slopes up to the east along TR2 and has a vertical cut about 3 m south of the TR1-TR2 juncture. Lowermost fill is Stratum 3, an artifact and charcoal laden deposit that may represent primary burning of a structural feature; however, since no evidence of foundations or in situ burning was identified, this is more likely a secondary waste or debris disposal area subsequently buried by Stratum 2 rubble.

Several variations of surface Stratum 1 are present. Stratum 1 tops the F1-2 area with relatively culturally clean bouldery loam. South of F1-2, Stratum 1A2 contains fewer boulders than Stratum 1 and has a fine sandy nature. East of F1-2 in TR2, Stratum 1A2 contains common boulders and is also sandy in nature. All of these surface strata could represent floodwater deposits or reworking of sediments previously covering the mound. Stratum 1 could also be mechanical fill from an area generally lacking in cultural artifacts.

Lack of in situ structural footings and foundations on the F1 mound and presence of in situ mill tailings here suggest either this is not the actual millsite, but merely a portion of a tailings pond, or if this is the millsite location, the energies of the Carson River floodwaters have stripped away any visible basal ramifications of the mill and left only a jumble of mill parts. Additionally, we may have misinterpreted some of the depositional processes, and no doubt their complexities. However, even if we have not found the exact spot of the mill, the artifact assemblage of the mound is entirely consistent with a mill of the proper vintage, and key artifacts have survived diagnostic of each of the two periods of mill use, i.e. the arrastra stones from the Keller & Co. mill and the pan muller shoe from the reconstruction by Lindauer & Co.

Site 894-2 Rock Point Ditch

Historic Context

The Rock Point Mill is the same vintage as the Keller & Co. mill, dating to 1861 and operating through several reconstructions into the 1930s (SAIC 1993 (1):105-110). Some evidence exists that the pan mill was preceded by an 1859 arrastra mill and associated water rights (Dangberg 1975:342-346). Water rights for the Rock Point Ditch were claimed by R. M. Hotaling in 1860. Despite the fact that this diversion was located upstream of the study area in the SE1/4 SW1/4 SE1/4 Sec. 23, the ditch is not shown on the 1865 survey plat, suggesting that during the early years of its use a diversion near the bridge downstream of the study area may have been used (United States vs. Alpine Land & Reservoir Co. n.d.:129). Similarly, the Rock Point Ditch is not shown on any of the three detailed maps of the Keller & Co. mill site during the 1860s and 1880s. Instead, the dam for the Rock Point Ditch is always shown downstream of the bridge north of the study area (Figure 5). All of this evidence suggests that the portion of the Rock Point Ditch in the study area post-dates 1885 and was no longer in use by the early 1940s.

Dangberg (1975:347) quotes L.H. Taylor (from 520, Plaintiff's [3]:190) as follows:

> The Rock Point mill ditch takes water from the left fork of the Carson River just below the town of Dayton.
>
> The upper portion of this ditch consists of a channel in earth, while for a considerable distance at its lower end the water flows through a box flume eight feet wide at its head and having a depth of 3.83 feet toward the upper end, and 4.10 feet near the penstock at the mill. A section measured just above the mill

387 feet in length has a grade in this distance of 0.04 of a foot, taking the level of high water mark for hydraulic grade, and a mean depth of 3.625 feet. On the inside of this flume are four 1x4 inch battings nailed over cracks, which reduce the sectional area to 28.89 square feet, with a mean radius of 1.8147 feet.

The carrying capacity, with coefficient for roughness 0.012 is 52.73 cubic feet per second, or 2635.5 miner's inches.

The maximum capacity of this flume at the place where measured, taking the grade of the bottom which is 0.295 of a foot in 387 feet, and assuming the flume to have a free discharge, is 150.0 cubic feet per second, or 7500 inches.

Physical Remains

Aside from an informal driving tour, no attempt was made to revisit the entire ditch. Detailed description is limited to the study area. On the ground surface the ditch is manifested as a linear depression (Feature 1) running along much of MS001 North and disappearing just north of MS001 South.

Trenches 3 and 4 were used to look at the subsurface manifestations of the suspected location of one alignment of the Rock Point Ditch or mill race. TR3 is 14 m long and oriented 116 degrees, while TR4 is 10 m long at 104 degrees divided into two segments, one crossing the ditch and one cutting through the adjacent berm (Figure 6). Both trenches were placed perpendicular to an existing linear depression thought to be the ditch remnant. TR3 is just west of the mound discussed above and TR4 is downstream from the mound.

Three strata and two interfaces were noted in trench exposures of the Rock Point Ditch (894-2). Stratum 1 consists of overbank deposits of loam with inclusions of primarily modern domestic household debris such as plastic bread wrappers, aluminum beer cans, and 1979 newspaper fragments. This stratum could represent recent (1986) floodwaters mixing with modern Dayton debris, or mechanical filling of the ditch low spot with surrounding overbank deposits and burial of backyard garbage. Interface 2 appears to be a mechanical cut on the burned surface outside of the ditch and a ditch surface prior to the deposition of Stratum 1. Stratum 3 is a clean sandy deposit at the base of the Interface 2 ditch. Stratum 4 appears to be the oldest visible ditch fill and contains artifacts over 50 years old mixed with overbank flood deposits. One bottle base exhibits a sand pontil dating it to before about 1870. Interface 5 is the ditch cut or the interface between the ditch and outside strata. This cut suggests the lowest part of the ditch is about 5 m wide, while the top of the ditch is approximately 6 m wide. Maximum depth of the ditch is 1.4 m as seen in TR3.

A berm (exposed in TR4A) just east of the ditch appears to be related and is built of sediment containing artifacts from the ninteenth century in three strata. Stratum 9 is a thin surficial layer that may represent the final episode of berm building, an episode of ditch clean out and piling on the berm, or natural accumulation of organic rich duff. Stratum 10 is a

mechanically redeposited mixture of natural overbank deposits mixed with small wavy clasts of mill tailings and probably represents an episode of ditch clean out in TR4B with redeposition on the berm. Stratum 11 may be the original berm comprised of overbank deposits with cultural material but lacking the silt and fine sand mill tailing clasts common in the overlying stratum. An interface (2) is at the base of the berm and immediately above a massive, horizontally bedded deposit of mill tailings (Stratum 12 where mechanically disturbed and Stratum 13 when undisturbed). These very fine sand, fine sand, and silt beds with iron oxide crusts paralleling many of the graded beds presumably were deposited in a pond near the millsite.

Natural strata were found east of the ditch in TR3 and these include only overbank deposits (strata 6, 7, and 8) of the Carson River. Artifacts were not noticed in the profiles of any of these loamy and sandy alluvial deposits.

In summary, allowing for slumping side walls, the Rock Point Ditch was unlined at this point, was about 5 m wide, and 1.45 m deep. At least for some of its length it had a substantial berm on the Carson River side of the ditch, formed at least partly of ditch cleanout debris.

MS001 SOUTH (Dayton, SE¼ NW¼ SE¼ Sec. 23 T.16N R.21E, USGS Dayton 7.5')

The study area was inundated by the reservoir for the Keller & Co. Mill, and was part of the main channel of the Carson River during the 1880s. It is adjacent to a relic meander of the Carson River that was used as a reservoir feeding the Rock Point Ditch in later years. This portion of the water system is well shown on the 1909 Dayton Map. At some point after abandonment of the ditch system this area was leveled for use as a pasture. Extensive areas were bladed in the course of making a pond adjacent to the Carson River. The division between MS001 North and South only has significance in relation to modern property lines. The artifact scatter related to Site 894-1 continues into this area. Similarly, although presently obscured, the Rock Point Ditch (Site 894-2) also extended into MS001 South. It is likely that the alignment of cottonwoods shown on the site map included with the site form reflects the location of the former ditch bank

Three excavation units (EU4, 5, and 6) were placed in this area with similar stratigraphic results. Strata from these units were correlated into one series of descriptions (Figure 7). All upper strata (1, 1A, 1B, 1C, and 1D) are moderately well sorted beds of silt, fine and very fine sand with horizontal bedding. These strata contain historic, and in the uppermost level, modern artifacts. These strata closely resemble remnants of mill tailings found in other parts of the project area. Upper strata are thickest on the northern part of the area at 30 cm in EU6, and thinnest at 5 cm in EU4. Below this stratum is a tailings-overbank deposit interface (2) thought to be the natural-cultural boundary, although in all cases cultural material was found below this interface, possibly as a result of mixing by roots or rodents. Conversely, the uppermost levels of the overbank deposits formed a cultural surface prior to the tailings deposition. Loamy overbank deposits (Stratum 4) were present immediately below this transition in EU4 and EU5; however, a

channel deposit of sandy and gravelly alluvium was present below this interface and above loamy overbank deposits in EU6. Strata present on this part of the project area reflect alluvial floodwater and channel deposits overlain by a relatively thin veneer of tailings possibly deposited within a ponded or reservoir setting. Features were not located within any of these units, albeit a very small portion of this area was exposed.

MS030, SITE 894-3 (Silver City, NW¼ SE¼ SE¼ Sec. 8, T.16N R.21E, USGS, Virginia City 7.5')

Location and Historic Context

The study area comprises a small terrace adjacent to a fork where the road from Silver City to the Silver City Spur on the Virginia and Truckee Railroad departs from the road up American Ravine to American Flat (the record map at the NSM incorrectly shows the Silver City Spur on the road adjacent to the study area; actually it traversed a hillside to the south).

In addition to being along one of the routes from Silver City to its hinterland, connecting ultimately with American Flat and Carson City, American Ravine was the scene of early Comstock placer mining. The parcel is about midway between the Bacon and Trench Millsite (downstream), the Silver City Mill (upstream on the American flat Road), and the Union Mill (upstream on the American Ravine Road). Due to recent blading, tailings are visible in the study area. These tailings could be from either of the upstream mills.

The Trench Mill (Sparrow, Trench & Co.'s Mill; French Mill) was a stamp and pan mill built in 1860 or 1861 that stood until at least 1904 (SAIC 1993[2]:69-71). The Silver City Mill (Lambert's Mill) was a small steam-powered stamp mill constructed in 1861. The mill stood at least until 1864 but is not shown on an 1874 map of Silver City (SAIC 1993[2]77,84). The Union Mill was built in 1861 and is shown on an 1874 map of Silver City (SAIC 1993[2]:83-84).

As shown by the 1874 Ross E. Browne townsite map of Silver City, the bottom of American Ravine was lined by small houses, much as it is today. In addition to the probability of roadside trash deposition, there is a likelihood of extensive domestic trash deposition from these residences.

Physical Description

At the time of the initial visit in April 1996, the site was covered by big sagebrush and exhibited several possible pit or trench features. Secondary dump debris including domestic, milling, and architectural debris was noted. Since that visit the surface has been bladed to a depth of up to several inches, revealing thousands of artifacts (Figure 8). Mill-related artifacts were clearly not in original locations, mixed up among domestic debris. While a few nineteenth century artifacts were noted, including wine and ale/stout bottle fragments and cut nails, by far

the majority of the artifacts were from the 1940s and continuing into the early 1950s. Mill tailings and mine waste rock were exposed, confirming that the terrace was at least partly of human construction.

SIGNIFICANCE

The four criteria for evaluating the significance of archaeological sites in terms of eligibility for inclusion in the NRHP are as follows (36CFR60):

> The quality of significance ... is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:
>
> A. That are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> B. That are associated with the lives of persons significant in our past; or
>
> C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> D. That have yielded, or may be likely to yield, information important in prehistory or history.

In addition, properties less than 50 years old are not normally eligible for the NRHP. Since the National Park Service emphasizes that a property qualifying for the NRHP must both be associated with an important historic context and "retain historic integrity of those features necessary to convey its significance," it is clear that significant historical archaeological sites are likely to relate to more than one criterion (*National Register Bulletin* 15, How to Apply the National Register Criteria for Evaluation:3).

MS030 is within the Comstock National Landmark District. It therefore is subject to provisions of 36 CFR 800 Subpart C in addition to the other regulations in 36 CFR 800 relating to complying with Section 106.

MS001 NORTH

Two historic properties lie partly within this parcel; they are the Rock Point Ditch and the Keller & Co. Mill. In addition there are domestic artifacts. Further complicating the interpretation of archaeological remains is that the study area adjoins and is immediately behind

the railroad yard of the Carson & Colorado R.R., later the Southern Pacific R.R. Houses for the agent and section foreman occupied the lot along with the small train depot as shown on the 1909 map of Dayton.

Keller & Co. Mill (894-1)

The Comstock (including the Carson River and Washoe Valley mills) is renowned as the birthplace of the "Washoe Pan Process" of milling. This process was not developed solely in any single mill and was characterized by a lengthy period of experimentation in details of the process. For these reasons, any intact mill remains from the Comstock have potential to provide information relating to this significant theme. During the ninteenth century there was a proliferation of pan mills. For example, in 1866 there were 77 mills processing ore for the Comstock alone (Nevada State Legislature 1867). However, this first generation of mills did not survive as intact mills, and few are reasonably intact even in the archaeological record. Some pan mills in outlying districts retain fairly good preservation of the spatial distribution of all mill features. An example is the Nevada Butte Mining Company Mill in the Battle Mountain district (Reno and Fenicle n.d.), but most only have preservation of some portion of the entire mill area at best. On the Comstock, where the process was first developed, mills have not survived well due to extensive later modifications of the landscape. Hence, any Comstock mill that retains any intact features has the potential to contribute to our presently limited knowledge of how details of the process were expressed in actual workplaces. Intact mills could easily be significant under criteria A, C, and D. Only mills associated with key developers of the process such as Almarin Paul would be significant under Criterion B. Although the original builders of the mill in the study area were of local importance, their merchandise business rather than the mill has the closest association with their local significance.

On the surface, this mill seat retains no integrity and is not eligible. Based on subsurface testing, we now know that there is at least some integrity of location since artifacts diagnostic of both milling episodes were found in the mound area of the site. However, these deposits have been extensively moved about before reaching their current resting places. Only one possible wall remnant (likely to simply be some riprap) was found in place. No other intact features were found and the artifact-rich strata are jumbles of poorly preserved redeposited items. Therefore we recommend that the remnants of the in MS0001 North mill be considered non-significant.

Rock Point Ditch (894-2)

The Ditch provided water for the Rock Point Mill at the north end of Dayton; the mill proper is outside the study area. The Rock Point Mill (CrNV-03-1606) exhibits extensive foundations relating to the different phases of site use and appears to be a NRHP significant site. The main mill area and closely related features has been recommended significant both by Elston (1978) and Seldomridge (1987). It is currently incorporated in interpretive programs at the

Dayton State Park. The reservoir adjacent to the mill is in excellent condition and comprises by far the largest feature on the site.

The Rock Point Ditch is more problematic. Since its course lies directly through the town of Dayton, most of it has been covered or bladed away by subsequent land users. The remnants offer little interpretive potential in relation to the main mill complex. The segment crossing U.S. 50 was judged non-significant by Seldomridge (1987). Due to the existence of many other mill and mining-related ditches in less improved areas (particularly Rose's Ditch), there is no reason to consider this ditch a particularly good example of this class of feature. This leaves research potential of individual segments such as the ones sectioned during this testing program. Although remnants of the ditch were sectioned, they were heavily damaged by subsequent filling, and do not show engineering features of any particular interest. We recommend that the Rock Point Ditch be considered non-significant.

Artifact Concentration (894-1)

Dayton, like most urban centers, is surrounded by and rests on a concentration of artifacts generated throughout the life of the site. At this location artifacts are present ranging from the late ninteenth century to present. The most significant artifacts from a historic perspective are probably timbers and other parts of the Sutro Tunnel on site. However, these items have been removed from their original location and hence cannot be considered NRHP eligible. Although there are hundreds of historic artifacts (over 50 years old) on the ground surface and in subsurface strata, these materials are highly fragmented and their distribution cannot confidently be associated with particular activities or households. Identification of household context is generally critical for studies of domestic artifacts to have significance in an urban setting. Such identification at this site is hampered by being outside of the area covered by insurance company maps. In the case of the Comstock, there is a long-term research agenda oriented toward studies of ethnic groups and their related material culture. This surface scatter lacks such contextual ties and is not considered significant.

Subsurface concentrations of artifacts would suggest the possibility of more meaningful patterning and perhaps sufficient information content to be eligible under Criterion D. Information from the test excavations and trenches indicates that subsurface artifacts have also been moved around, fragmented, and redeposited as fill episodes. Therefore we do not consider the subsurface artifacts to be significant.

MS001 SOUTH

Site content consists of a continuation of the scatter of highly fragmented surface artifacts noted above in MS001 North. Like the rest of the scatter, surface indications do not appear to be significant. The three test pits in this portion of the site support the notion that artifacts have been spread through this area as part of grading episodes through time. Although ninteenth

century artifacts were found, the geological context suggests they are not in their original place of deposition. Therefore, this portion of Site 894-1 is not significant.

Although the Rock Point Ditch went through this area, the ditch has been entirely obliterated by subsequent grading. Regardless of the significance of the entire ditch, this could not be considered a significant portion.

MS030 (894-3)

In situations where domestic debris concentrations have high chronological focus and can be securely tied to contextual materials about the households that generated the debris, such sites can be significant for their information potential under Criterion D. This site consists of a jumble of artifacts ranging from a few ninteenth century items to an extensive assemblage from the 1940s to 1950s. The mixing of artifacts and lack of focus makes this site nearly worthless for addressing research questions about households on the Comstock. It is not significant under Criterion D.

MANAGEMENT RECOMMENDATIONS

For all three areas we recommend that the proposed remediation take place as planned.

Since our testing efforts have been limited to a small percentage of the site area, archaeological monitoring is recommended at all areas where remediation will involve excavation. The monitor should collect additional subsurface information on the site during remediation, such as the boundaries of the tailings pond discovered at MS001 North in Trench TR4. It is likely that additional arrastra stones will be uncovered during remediation. These stones should be cleaned and given to the Spragias, hopefully for eventual housing at the Dayton Historical Society.

We do not anticipate that additional significant resources will be found during remediation, but should they be uncovered, the monitor will immediately notify E & E. A contingency plan should be in place for conducting archaeological data recovery should intact buried features or artifact deposits be encountered; this plan should be developed between DOE and SHPO ahead of time. This plan should be developed between the EPA and SHPO ahead of time to avoid delays due to consultations.

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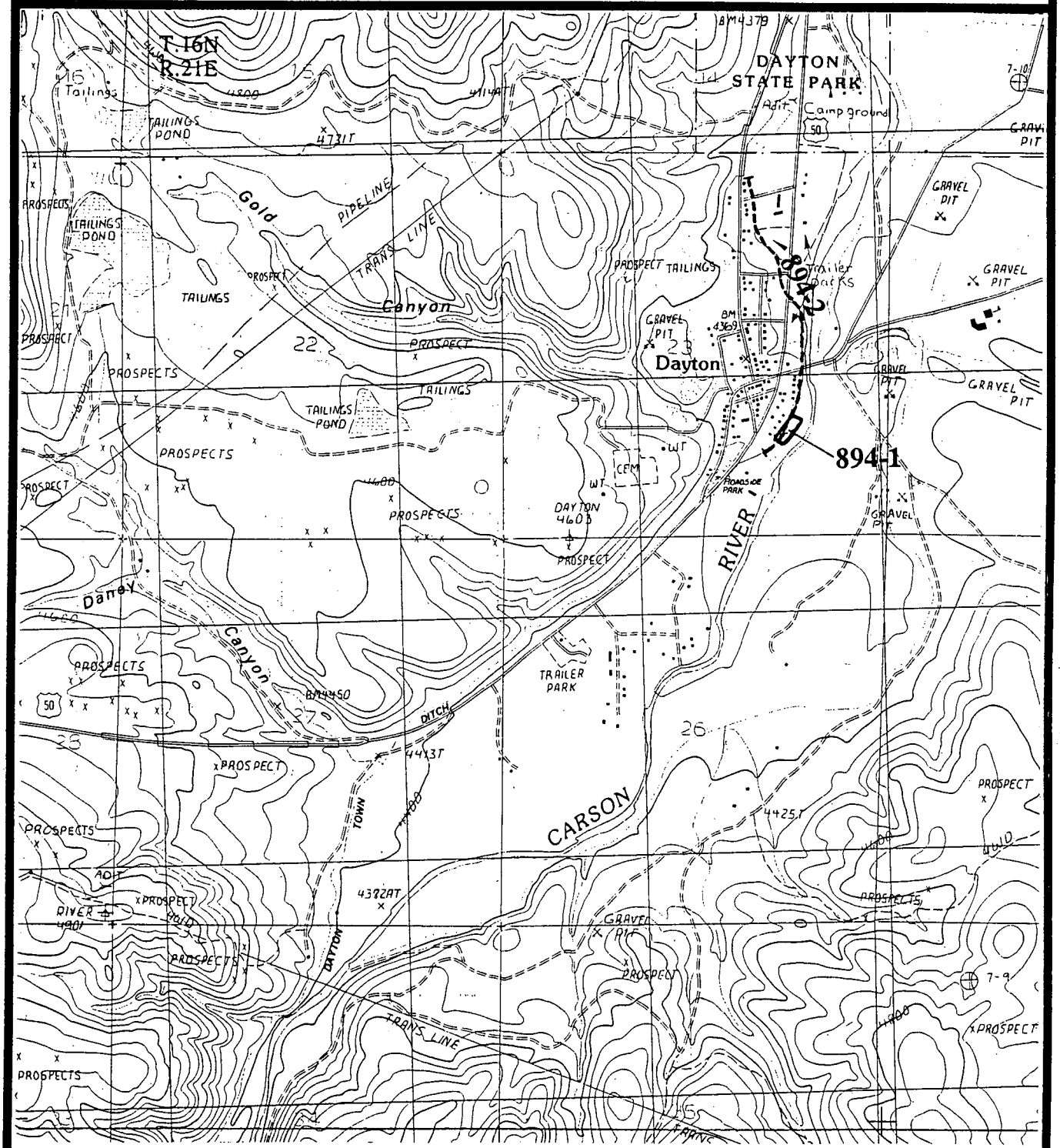
Figure 1. Site Location Map



.0 .5 1.0 Miles

.0 .5 1.0 Kilometers

Archaeological Research Services, Inc.

Project No: ARS 894
County: Lyon
Map: Dayton, Nev. Prov.. Ed. 1987
Scale: 1:24,000

N

Figure 2. Site Location Map

.0 .5 1.0 Miles

.0 .5 1.0 Kilometers

Archaeological Research Services, Inc.

Project No: ARS 894
County: Lyon
Map: Virginia City, Nev. 1967
Scale: 1:24,000

N ↑

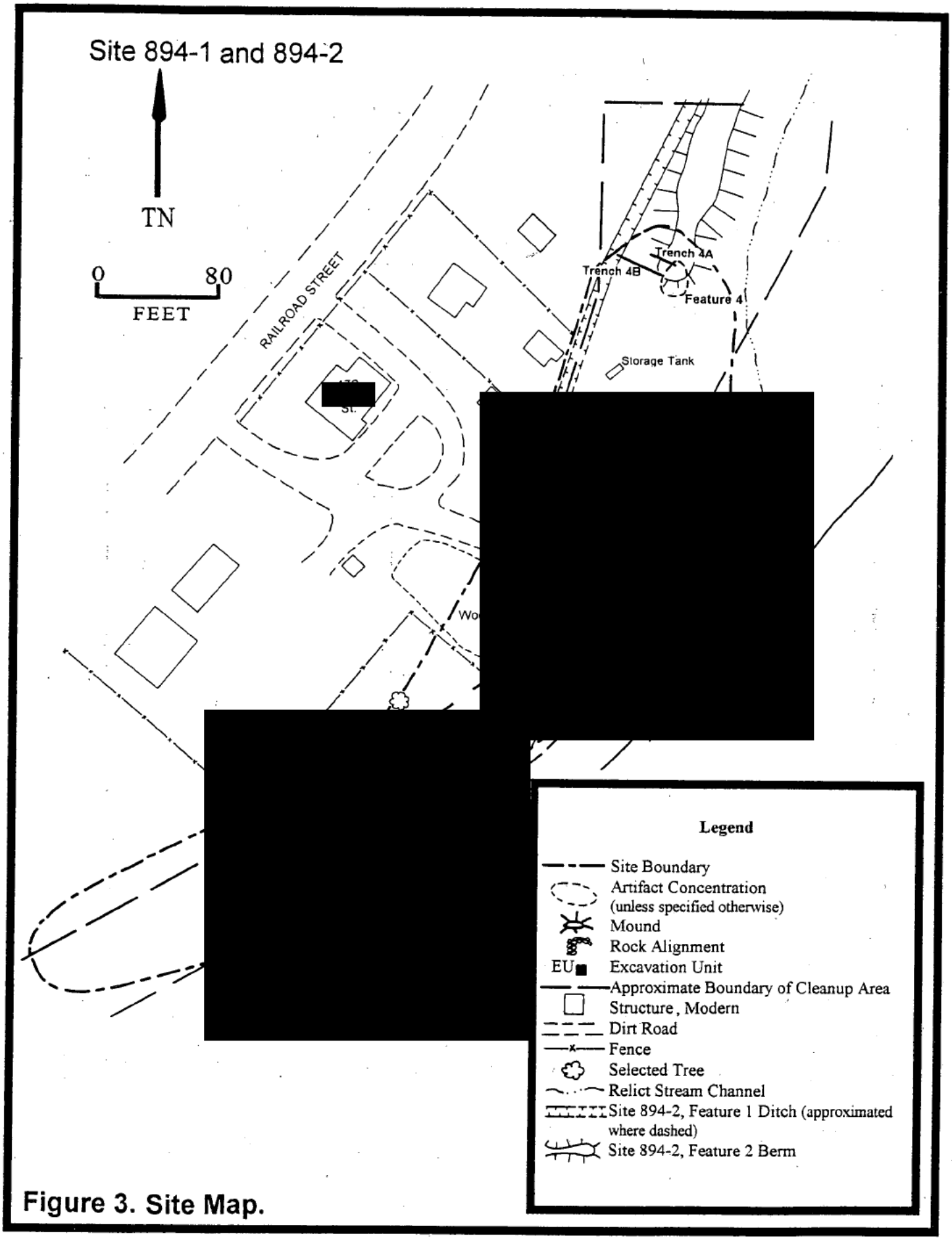
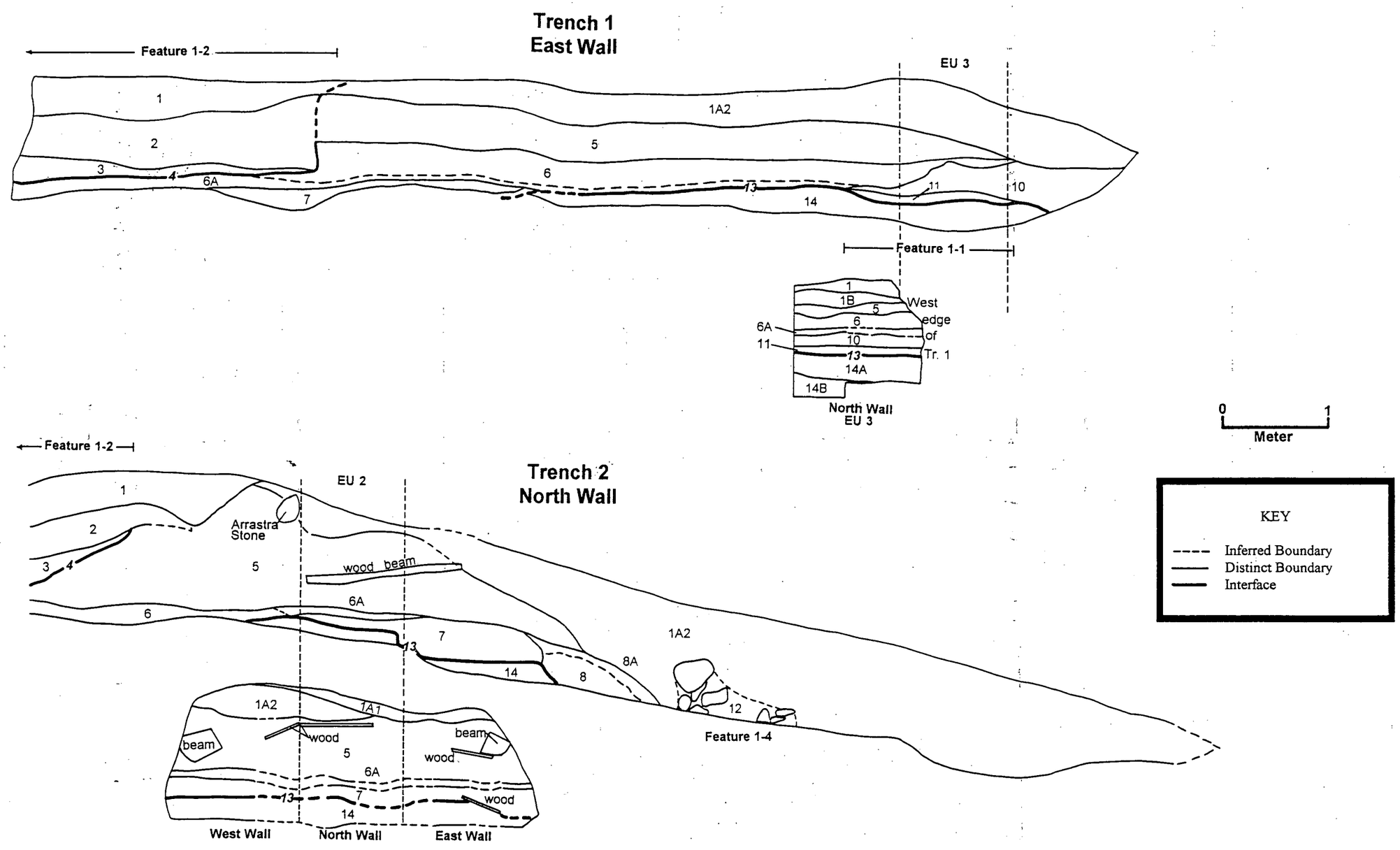


Figure 3. Site Map.

Figure 4. Stratigraphic Profiles for MS001 North



MS001 North
Figure 4 Strata Description
Site 894-1 Trenches 1 & 2, EU 2 & 3

Cultural Fill in Feature 1-2 Depression

1 10YR4/3 brown (dry), 10YR3/3 dark brown (moist); very poorly sorted gravelly sandy loam texture; massive structure; non-sticky, non-plastic, dry loose to soft consistency; inclusions of aqua and olive glass, brick, modern hoses and debris in upper 10 cm, grass, brush and cottonwood roots; no reaction to HCl; gradual smooth boundary. Surface fill on top of Feature 1 mound, may have come from nearby Carson River bouldery alluvium, may have purposely buried the mill site.

2 10YR6/3 pale brown (dry), 10YR5/3 brown (moist), mottles 10YR5/6 yellowish brown, 10YR8/2 very pale brown, 10YR8/1 white, 10YR8/6 yellow, 10YR8/4 very pale brown (dry); mostly fine sand to small boulders to silt; massive; non-sticky, non-plastic, dry soft; brick, aqua glass, charcoal, common medium to coarse roots; no reaction to HCl; abrupt smooth boundary/irregular and gradual locally. Fill with ca. 50% very fine sand; the various colors are probably mill tailings; bulldozed push pile of materials from nearby - silt clasts hold their subhorizontally stratified integrity and thus have probably not been moved far from their place of deposition.

3 10YR5/2 grayish brown (dry), 10YR4/2 dark grayish brown (moist); poorly sorted fine to very fine loamy sand; massive; non-sticky, non-plastic, dry soft; charcoal, cut nails, aqua and olive glass, brick, copper triangles, large metal pieces, glass carboy fragments, fine sand tailings concretions, roots; no reaction to HCl; clear smooth boundary. Possible debris lens filling the base of a large pit or hole, partially burned; Feature 1-2 fill.

4 Interface or cut that was filled with debris; Feature 1-2 cut.

Cultural Fill Outside of Feature 1-2 on Feature 1 Mound

1A1 10YR6/3 pale brown (dry), 10YR5/3 brown (moist); poorly sorted fine sand; massive to platy parallel to slope; non-sticky, non-plastic, dry loose to soft; roots, rootlets; abrupt boundary; no reaction on top to weak reaction to HCl near base; abrupt boundary; surficial slopewash and or wind reworking.

1A2 10YR6/3 pale brown (dry), 10YR5/3 brown (moist); moderately well sorted fine sand, 5% boulders; massive; non-sticky, non-plastic, dry soft to loose; rare tailings blobs, wood, duff, roots and rootlets; no reaction to HCl; wavy clear boundary. Possible mechanical disturbance.

1B 10YR6/4 light yellowish brown (dry), 10YR5/4 yellowish brown (moist); moderately well sorted very fine sandy loam; massive with local silt blebs; non-sticky, non-plastic, dry soft; silt blebs, roots, rootlets; no reaction to HCl; abrupt smooth boundary. Tailings mixed in upper strata on site; possible mechanical disturbance.

5 10YR6/3 pale brown (dry), 10YR5/3 brown (moist), with dry mottles of 10YR8/3 very pale brown, 10YR6/2 light brownish gray, 10YR6/6 brownish yellow; moderately well sorted fine sand; massive; non-sticky, non-plastic, dry soft; wood, arrastra stones, barrel parts, white earthenware, bricks, metal, roots, tailings blebs; no reaction to HCl, except some of the very fine sand/silt blobs have a moderate reaction; clear smooth boundary. Mill site rubble, possible mechanical disturbance.

6 10YR7/2 light gray (dry), 10YR6/2 light brownish gray (moist); very poorly sorted medium sands to well sorted very fine sands, 3% pebbles to granules; massive, subhorizontally bedded, depressed under rocks, course beds 6 cm thick, fine beds greater than 1mm thick, generally fining upward through stratum; charcoal, brick, rootlets, roots; weak reaction to HCl near base of stratum; abrupt smooth boundary. In situ, water laid tailings and few pebbles and other clasts near surface of stratum. One boulder appears to have been thrown on west stratum and deformed underlying laminae.

6A 10YR6/2 light brownish gray to 10YR6/3 pale brown (dry), 10YR5/2 grayish brown to 10YR5/3 brown (moist); moderately well sorted coarse silt loam to well sorted very fine sand; massive with subhorizontal stratification; non-sticky, non-plastic, dry soft; charcoal, nails, wood fragments, few colored tailings blebs, roots, rootlets, krotovina; moderate reaction to HCl locally; abrupt smooth boundary. Mill tailings, ponding episode at the base of Stratum 6.

7 10YR5/3 brown (dry), 10YR4/3 brown (moist); moderately sorted very fine sandy loam; massive; non-sticky, non-plastic, dry slightly hard; wood, charcoal, metal, roots, rootlets; moderate reaction to HCl; clear smooth boundary. Basal level cultural material.

8 10YR5/3 brown (dry), 10YR4/3 brown (moist), mottles 10YR8/4 very pale brown (dry); darker color is poorly sorted medium sand, lighter color is well sorted fine sand and silt, 10% pebbles; massive, locally light and dark colored areas interbedded; non-sticky, non-plastic, dry soft; brick fragment, roots; no reaction to HCl; clear smooth to wavy boundary. Colluvial action or mechanical deformation to get this mix of tailings and gravels on the edge of the Stratum 10 possible terrace.

10 10YR5/2 grayish brown (dry), 10YR3/2 very dark grayish brown (moist); poorly sorted sand, pebbles to silt, medium mode; massive; non-sticky, non-plastic, dry soft; nails, metal, rootlets, roots; no reaction to weak reaction to HCl; abrupt irregular boundary. Fill on south edge of the Feature 1-1 berm, possibly to hold stratum 6 and a small mill tailings pond.

11 10YR8/1 white (dry), mottles 10YR2/1 black (dry); poorly sorted very fine sand; massive; non-sticky, non-plastic, dry hard; metal fragments, charcoal, spruce glass, copper sheet, slag/clinker pebbles to 2 cm diameter, rootlets; strong reaction to HCl; abrupt smooth boundary. Possibly primary or secondary deposit of hotly burned material, the white may be lime, mortar or ash.

12 10YR6/3 pale brown (dry), 10YR5/3 brown (moist); bouldery sandy loam, ca. 50% boulders; massive; non-sticky, non-plastic, dry soft; roots, krotovina; moderate reaction to HCl; gradual irregular boundary. Appears to be a collapsed 4 coarse or higher rock wall or berm, possibly rip-rap on the east side of the Feature 1 mound.

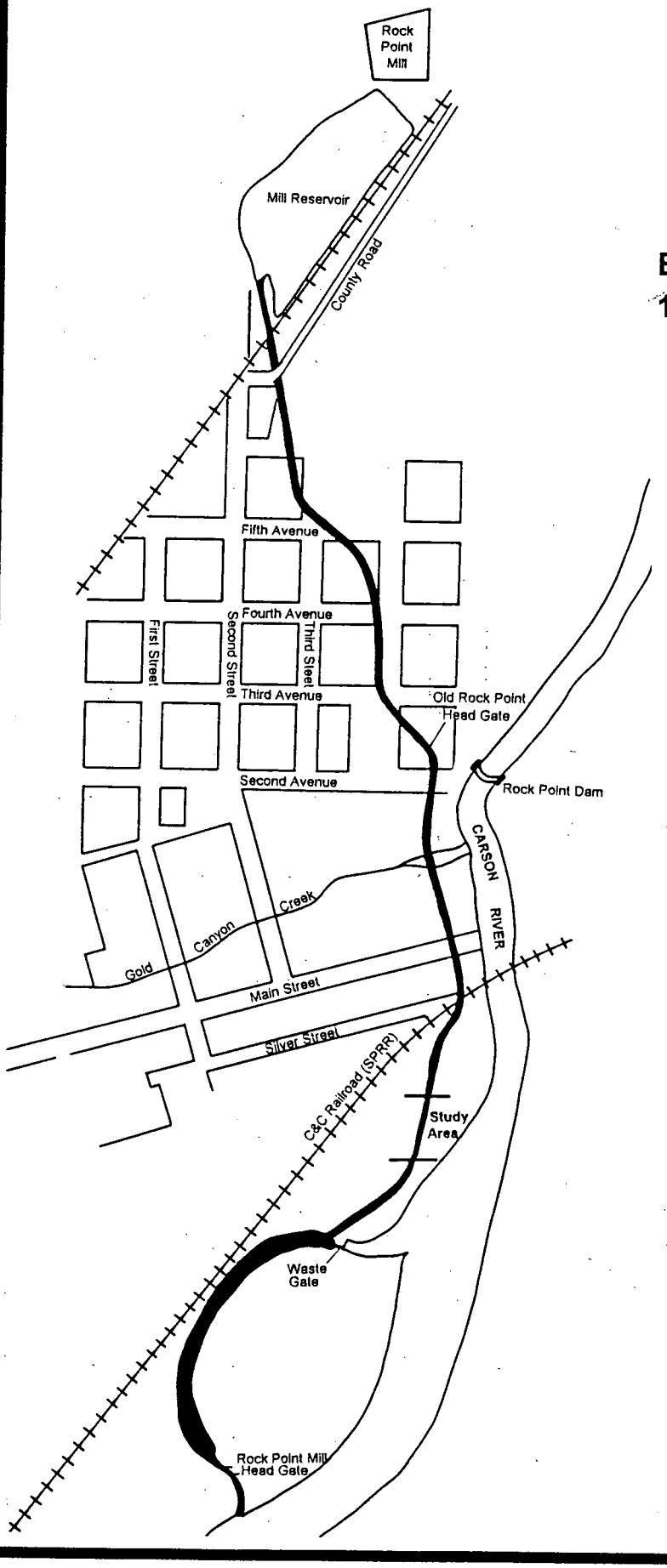
13 Interface between natural and cultural strata, on Feature 1 mound.

14 10YR4/2 dark grayish brown (moist); poorly sorted sand, medium gravels to medium sand; massive, possibly fining upward sequence where exposed; non-sticky, non-plastic, dry loose; charcoal, olive and aqua glass, brick, nails, wood, unknown metal, roots; no reaction to HCl; boundary not exposed. Primary or secondary Carson River deposits.

14A 10YR5/3 brown (dry), 10YR4/3 brown (moist); very poorly sorted gravelly fine sand, gravels round to subrounded to 18 cm diameter; massive; non-sticky, non-plastic, dry loose to soft; few glass and nails, roots, rootlets; clear smooth boundary. Gravel bar deposits of the Carson River.

14B 10YR5/3 brown (dry), 10YR4/3 brown (moist); moderately sorted fine sand; massive; non-sticky, non-plastic, dry soft to moist; one nail, few roots at upper contact; boundary not exposed. Sand bar deposits of the Carson River.

Figure 5. Site Map.



Site 894-2
Rock Point Ditch
Based on Dayton Town Plat Map
1909 (160'=1") and 1905 (150'=1")

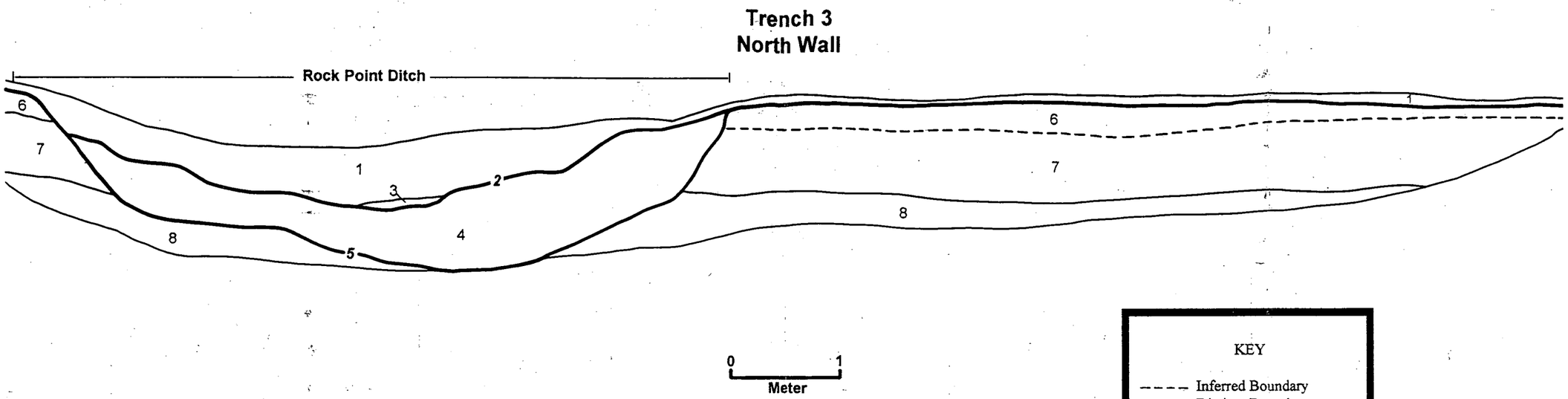
TN

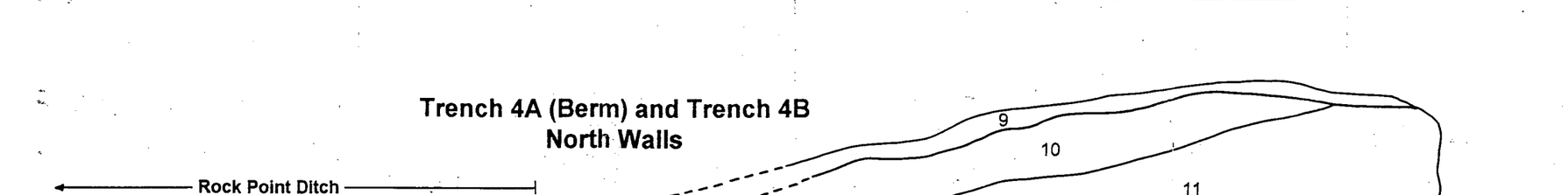
0 640
FEET

Legend

Rock Point Ditch
Railroad

Figure 6. Stratigraphic Profiles for MS001 North





MS001 North
Figure 6 Strata Descriptions
Trenches 3, 4A and 4B

Strata Descriptions:

Rock Point Ditch Strata

1 10YR6/3 pale brown (dry), 10YR4/3 brown (moist), white-gray mottles; poorly sorted sandy loam texture; massive to weak subangular blocky structure; non-sticky, non-plastic, dry soft consistency; inclusions of wire nails, plastic, screen mesh, fiberboard, aluminum beer cans, brick fragment, 1979 newspaper, aluminum pull-tops, charcoal, bed spring, wood fragments, roots and rootlets; weak to moderate reaction to HCl; abrupt wavy boundary. Burial of modern domestic debris mixed with dirt; appears to have been bulldozed into the existing depression or ditch to level the area.

2 Interface; a mechanical cut removing the A soil horizon east of the ditch.

3 10YR6/4 light yellowish brown (dry), 10YR4/4 dark yellowish brown (moist); moderately well sorted fine sand; massive to single grain; non-sticky, non-plastic, dry soft; rootlets; very weak reaction to HCl; abrupt wavy boundary. Possibly originated by ponding or dumping of a bit of sand near the lowest spot in the depression or ditch.

4 10YR6/3 pale brown (dry), 10YR4/3 brown (moist); poorly sorted sandy loam with 10% cobbles and pebbles; massive; non-sticky, non-plastic, dry soft; clear brown and amethyst glass, butchered bone, rusted sheet metal, wood, coal, boot parts, cut nails, duplex nail, roots and rootlets; weak reaction to HCl; clear to smooth wavy boundary. Ditch/depression fill, late 19th, early 20th century domestic debris appears mixed with sediment to level area.

5 Interface; major ditch cut may represent one or more episodes of cutting and cleanout activity.

Natural Strata

6 10YR5/3 brown (dry), 10YR4/3 brown (moist); poorly sorted fine sandy loam; massive to coarse platy in upper 3cm; slightly sticky, slightly plastic, dry hard; rootlets, fine bits of charcoal; moderate reaction to HCl; gradual smooth boundary. Natural Bk soil horizon developed in overbank deposits of Carson River.

7 10YR6/2 light brownish gray (dry), 10YR5/2 grayish brown (moist) with white carbonates; poorly sorted very fine sandy loam; massive; non-sticky, non-plastic, dry hard; rootlets, carbonate blebs to 2mm; strong reaction to HCl; clear smooth boundary. Ck soil horizon developed in Carson River overbank deposits.

8 10YR5/3 brown (dry), 10YR4/3 brown (moist) with iron staining 10YR5/4 yellowish brown (dry), 10YR3/4 dark yellowish brown (moist); moderately well sorted fine sand; massive; non-sticky, non-plastic, dry soft; few rootlets; no reaction to weak reaction at Stratum 7/8 boundary to HCl; boundary not exposed. C2 soil horizon, splay or fining upward channel or overbank deposits; iron staining from water table flow through sands at base of Stratum 7.

Cultural Ditch Berm Strata

9 10YR5/3 brown (dry), 10YR4/3 brown (moist); moderately well sorted very fine sand; massive; non-sticky, non-plastic, dry loose; grass rootlets, roots; weak reaction to HCl; abrupt irregular boundary. Possible duff accumulation or ditch clean-out sediments piled on top of berm.

10 10YR6/3 pale brown (dry), 10YR5/3 brown (moist), mottles 10YR8/2 very pale brown (dry) and 10YR5/6 yellowish brown (dry); poorly sorted very fine sandy loam; massive-mechanically deformed; non-sticky, non-plastic, dry soft to slightly hard; tailings blobs, rusted iron, charcoal, olive glass, roots, rootlets; moderate reaction to HCl; abrupt to clear wavy boundary. Mechanically redeposited mix of Stratum 13 tailings.

11 10YR5/3 brown (dry), 10YR4/3 brown (moist); poorly sorted fine sandy loam (pebbles to silt); massive; non-sticky, non-plastic, dry slightly hard; bolt, charcoal, olive and aqua glass, roots, krotovina; moderate reaction to HCl; clear smooth boundary. Push pile from east to west, artifact rich (19th century) A soil horizon/overbank deposit pushed into a berm/dike just east of Rock Point Ditch.

Mill Pond Tailings

12 10YR6/3 pale brown (dry), 10YR4/3 brown (moist), mottles 10YR6/6 brownish yellow (dry); moderately well sorted very fine sand to well sorted fine sand; massive to mechanically disturbed; non-sticky, non-plastic, dry soft and friable; few roots and rootlets; moderate reaction to HCl; abrupt smooth irregular boundary. Mechanically deformed stratified deposits (industrial tailings in probable pond).

13 10YR8/2 very pale brown to 10YR7/2 light gray (dry), 10YR6/2 light brownish gray to 10YR5/2 grayish brown (moist); silt, very fine sand, fine sand; massive, subhorizontal bedding; non-sticky, slightly to non-plastic, dry loose, moderately friable; laminae and color of this stratum suggest industrial anthrosol, some charcoal; weak to moderate reaction to HCl; boundary not exposed. Stratified mill tailings of fine to very fine sand and silt; individual beds described below.

13A very fine sand with low angle cross beds.

B orange gray silt, iron staining on top.

C jumbled fine sand to silt as if dried and disturbed.

D Iron stain above and below gray, massive silt bed that crosses most of TR.4B.

E well sorted fine sand.

F Five laminae or beds ranging from silt to very fine sand to fine sand to silt to very fine sand.

G massive silt bed with iron staining above and below.

H thin dark gray silt bed.

I jumbled fine sand to silt as if dried and disturbed.

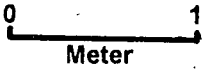
J horizontal fine sand bed.

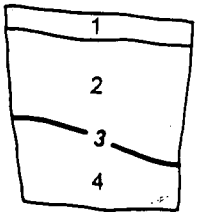
Upper Fills

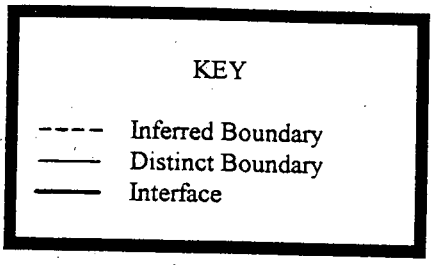
14 10YR6/4 light yellowish brown (dry), 10YR5/4 yellowish brown (moist); poorly sorted gravelly fine sandy loam with 12% rounded cobbles and pebbles; massive to weak platy; non-sticky, non-plastic, dry loose to soft; common roots and rootlets, 12% rounded cobbles and pebbles; weak reaction to HCl; clear wavy boundary. Fill originating from closer to Carson River with abundant rounded river gravels.

15 10YR5/3 brown (dry); 10YR4/3 brown (moist); poorly sorted sandy loam; massive; non-sticky, non-plastic, dry slightly hard; few roots and rootlets; weak to moderate reaction to HCl; abrupt smooth boundary. Channel or small ditch fill.

Figure 7. Stratigraphic Profile for MS001 North







Strata Descriptions

Cultural Strata

1 10YR6/3 pale brown (dry), 10YR4/3 brown (moist); moderately well sorted fine sand; massive; non-sticky, non-plastic, dry soft; roots, rootlets, carbonate blebs; weak reaction to HCl; abrupt to clear and smooth boundary. Fill.

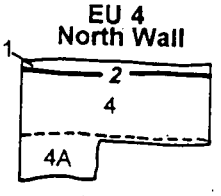
2 10YR6/3 pale brown (dry), 10YR4/3 brown (moist); moderately well sorted fine sand; massive; non-sticky, non-plastic, dry soft; brick fragments, cobbles and pebbles (possible manuports), roots, rootlets; abrupt to clear smooth boundary. Fill/originally overbank deposit.

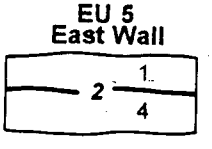
3 10YR7/2 light gray (dry), 10YR5/2 grayish brown (moist); silt; massive, 2mm thick lens; non-sticky, non-plastic, dry soft; no inclusions; moderate reaction to HCl; distinct smooth boundary. Interface; Silt flowing over a southeast sloping surface.

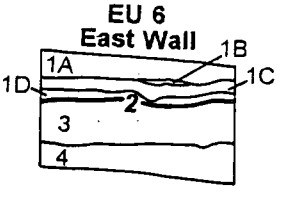
Natural Strata

4 10YR5/3 brown (dry), 10YR4/3 brown (moist); moderately well sorted fine sand; massive to single grain; non-sticky, non-plastic, dry soft to slightly hard; roots, rootlets; moderate to strong reaction to HCl; boundary not exposed. Possible sand bar deposit on the Carson River prior to fill episodes.

Stratigraphic Profiles for MS001 South







Strata Descriptions

Cultural Strata

1 10YR5/3 brown (dry), 10YR4/3 brown (moist); moderately well sorted fine sand texture; massive with subhorizontal bedding structure; non-sticky, non-plastic, dry soft to slightly hard consistency; inclusions of a few can and glass fragments, silt tailing blebs, rootlets, roots; weak reaction to HCl at top to moderate reaction at base; abrupt smooth boundary. Tailings.

1A 10YR5/3 brown (dry), 10YR4/3 brown (moist); moderately sorted fine sand; massive; non-sticky, non-plastic, dry soft; glass and can fragments, rootlets, roots; no reaction to HCl in upper stratum to weak reaction in lower stratum; abrupt smooth boundary. Possible fill, plow zone or tailings.

1B 10YR5/3 brown (dry), 10YR4/3 brown (moist); silt loam; massive; non-sticky, non-plastic, dry soft; rootlets; weak reaction to HCl; abrupt discontinuous wavy boundary. Possible tailings, krotovina disturbance or root cavity filled with silt.

1C 10YR6/3 pale brown (dry), 10YR5/3 brown (moist); moderately sorted fine sand; massive to single grain; non-sticky, non-plastic, dry soft; a few can and red pot fragments, some Stratum 4 blebs, rootlets; no reaction to HCl; abrupt smooth to wavy boundary. Possibly tailings.

1D 10YR6/3 pale brown (dry), 10YR5/3 brown (moist); coarse silt; massive; non-sticky, non-plastic, dry soft; rootlets; weak reaction to HCl; abrupt smooth to wavy boundary. Probably mill tailings.

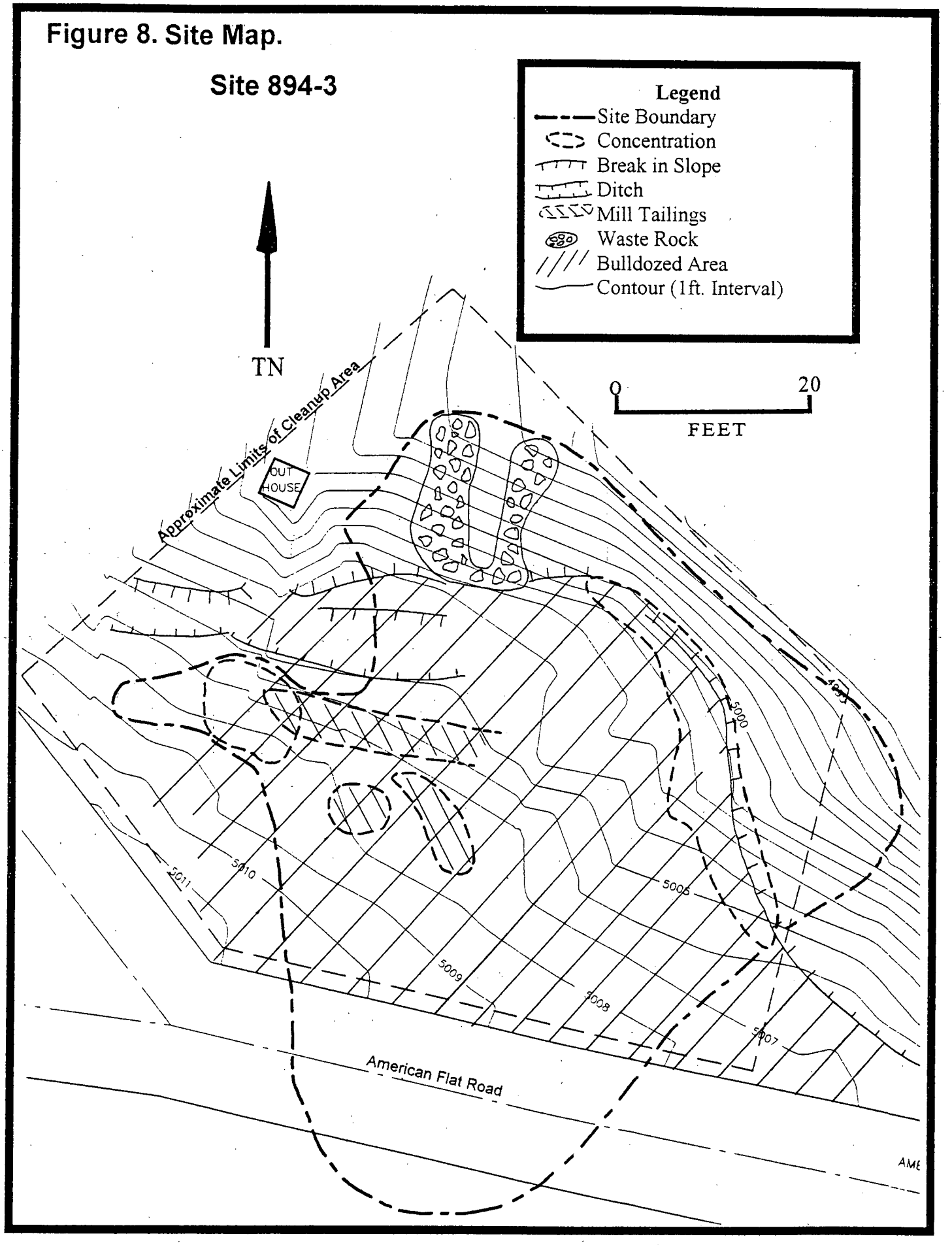
2 Interface between natural and cultural strata.

Natural Strata

3 10YR4/3 brown (dry), 10YR3/3 dark brown (moist); poorly sorted sand, ca. 5% round to subrounded pebbles; massive to single grain; non-sticky, non-plastic, dry soft; rootlets; weak reaction to HCl; abrupt smooth boundary. Stream deposits.

4 10YR5/2 grayish brown (dry), 10YR4/2 dark grayish brown (moist); loam; massive to weak subangular blocky; non-sticky, non-plastic, dry slightly hard; few roots and rootlets; moderate reaction to HCl; boundary not exposed. Overbank flood deposits.

Figure 8. Site Map.



APPENDIX A: IMACS SITE FORMS

IMACS SITE FORM

PART A - ADMINISTRATIVE DATA

Intermountain Antiquities Computer System

***1. State No:**
***2. Agency No:**
3. Temp. No: 894-1

4. **State:** Nevada **County:** Lyon
5. **Project:** Carson River Mercury Project (ARS #894)
* 6. **Report No:**
7. **Site Name:** Keller & Co. Mill, also known as Lindauer & Hirschman Mill, and as the Sweetapple Mill.
8. **Class:** Historic
9. **Site Type:** Metallurgical Mill.
* 10. **Elevation:** 4360 ft
* 11. **UTM Grid Zone:** 11 276620 **m E** 4345750 **m N**
* 12. SE¼ of NW¼ of SE¼ **of Section** 23 **T.**16N, **R.**21E
* 13. **Meridian:** Mt. Diablo
* 14. **Map Reference:** USGS Dayton Nev. 7.5', 1987; Piedmont Engineering 1"=40'
15. **Aerial Photo:**
16. **Location and Access:** The site is primarily in the backyard of the residence at [redacted]. The souther portion of the site is accessible from [redacted] a private driveway at the south end of Dayton, about 0.1 mile south of where [redacted]
* 17. **Land Owner:** [redacted]
* 18. **Fed. Admin. Units:**
* 19. **Location of Curated Materials:** No collections were made.
20. **Site Description:** Two mills for the processing of ore from the Comstock occupied the site. The original mill was built in 1861 by Joseph Keller and Isaac Cohen. This mill was reported to be 60 x 75 ft, with five stamps and four arrastras, run by a water wheel. The mill was transferred to Abram Lindauer and Moses Hirschman in 1862. At some point the mill was extensively reconfigured to a Washoe pan mill. Henry Sweetapple obtained a share by 1864. By 1865 the mill was powered by a combination of steam and water, had 15 stamps, and ten Wheeler pans. The mill was dismantled by the end of 1866. Physical remains of the mill are confined to remnants of this dismantling in a distinct mound in the center of the site (Feature 1). Backhoe trenches in this mound and hand excavation units confirm the presence of artifacts diagnostic of both milling episodes within the mound, but these items are not in intact deposits. There is also evidence of extreme burning, suggesting that following removal of salvageable materials the remaining structure was burned. The 1862 plat of the mill included with this form shows the mill building may have been to the northeast of the mound, in an area presently partly in the Carson River and partly on a low area frequently swept by high water. Water has played an active role on this site. In 1862 the mill reservoir covered the entire part of the site south of the mound. The dam for this reservoir extended from about where the mound now stands across the present river channel. A portion of this dam may be represented by a rock alignment recorded as Feature 2. By 1885 the dam had been swept away and the main river channel flowed over the entire site. In addition to these human-made channel alterations, the site has periodically been swept by floods.

    In addition to the mill remains there is an artifact scatter including 19th and 20th century domestic and architectural items. This scatter extends over the surface of the site and is preserved in the depression of the Rock Point Ditch (recorded as Site 894-2) that extended through the site in the first half of the 20th century. Artifacts preserved in the ditch berm are exposed as Feature 4. Testing has shown this debris to be highly fragmented and moved about where preserved in depressions. Most of the flat terrace surfaces have most soil either bladed or washed away. Hence, artifact concentrations observable on the surface, such as Feature 3, have no depth.

IMACS SITE FORM

PART A - ADMINISTRATIVE DATA

Intermountain Antiquities Computer System

***1. State No:**
***2. Agency No:**
3. Temp. No: 894-1

* **21. Site Condition (A-excellent, B-good, C-fair, D-poor):** Poor

* **22. Impact Agents:** Erosion (flooding); Dismantling; burned down; redeposition due to blading.

* **23. Nat. Register Status (C-significant, D-non-significant, Z-unevaluated):** Non-significant.
Justify: A Washoe pan mill would be significant under criteria A, C, and D if it had any intact features that would contribute to our understanding of the development of the Washoe milling process. Although the original mill owners were locally significant, their significance was primarily in relation to their store business, not their milling interests so it is not appropriate to consider their mill potentially significant under Criterion B. Due to the dismal state of preservation of the mill, it lacks sufficient integrity to be significant under any criterion.

24. Photos: Roll ARCP 431 fr. 3; ARCP 458 fr. 2, 5, 6; VC1 fr. 9, 20, 29, 33, 37.

25. Recorded by: R. Reno

* **26. Survey Organization:** Archaeological Research Services, Inc. (AR), P.O. Box 701, Virginia City, Nevada 89440

27. Assisting Crew Members: V. Clay, L. Hause, T. Burke

* **28. Survey Date:** 11/4 to 15/1996

List of Attachments:

Part B	✔Topo Map
✔Part C	✔Site Sketch
✔Encoding Sheet	Artifact/Feature Sketch
✔Photos	✔Other (Historic Map)

PART A - ENVIRONMENTAL DATA

Site No:
Agency No:
Temp. No: 894-1

* **29. Slope:** 0-4 **(degrees)** **Aspect** 100 **(degrees)**

* **30. Distance to Permanent Water:** 0 X 100 meters
Type of Water Source (A-spring/seep, B-stream/river, C-lake, D-other): River
Name of Water Source: Carson River

* **31. Geographic Unit:** Dayton Valley (BND)

* **32. Topographic Location:**
Primary Landform: Valley (E) **Secondary Landform:** Floodplain (J)
Describe: The site is on floodplain adjacent to the west bank of the Carson River. Microtopography includes a small mound at the center of the site.

* **33. On-site Depositional Context:** Stream terrace (D)
Description of Soil: Gravelly sandy loam. Archer (*Soil Survey of Lyon County Area, Nevada* 1984) mapped the west half of the site as Veta very gravelly sandy loam (map unit 701) and the east half of the site as Fallon fine sandy loam, frequently flooded (map unit 293). Although the floodplain is generally a depositional context, the site itself is in an erosional area subject to removal of materials by overbank flooding of the Carson River in a high energy location at a small curve in the river. Presently the bank is riprapped to reduce erosion and it seems that this practice may have been extant in the past in the mound area to protect the mill from water erosion.

* **34. a. Life Zone: Upper Sonoran**
b. Community: **Primary On-Site:** Tall Sagebrush (P)
Secondary On-Site: Developed/Agriculture (U)
Surrounding Site: Riparian (L)

Describe: Recently undisturbed areas have a cottonwood and big sagebrush overstory. Most of the site has been recently bladed. These developed areas are covered by dense Russian thistle, goathead, mustard, and grasses.

* **35. Miscellaneous Text:**

36. Comments/Continuations/Location of Curated Materials and Records:

PART C - HISTORIC SITES

Site No:
Agency No:
Temp. No: 894-1

1. **Site Type:** Metallurgical Mill/Domestic Debris Scatter
* 2. **Historic Theme(s):** Mining/Milling
* 3. **Culture:**
Affiliation: Euro-American (EA) **Dating:** Documents/Artifacts (I/F)
* 4. **Oldest Date:** 1861 **Recent Date:** 1866
How Determined?: Documents supported by artifact content. Date is for end of milling phase. Artifacts continued to accumulate to present.
* 5. **Site Dimensions:** 230 m x 50 m ***Area:** 9032 **sq m**
* 6. **Surface Collection/Method: (A-None, B-Grab sample, C-Designed sample, D-Complete collection):**
Sampling Method: None
* 7. **Estimated depth of fill: (A-surface, B-0-20 cm, C-20-100 cm, D-100 cm +, E-fill noted but unknown), F-Depth suspected but not tested):** 100 cm +
How Estimated (if tested, show location on site map): Backhoe trenches and hand excavation units.
* 8. **Excavation Status: (A-Excavated, B-Tested, C-Unexcavated):** Tested.
Testing Method: The mound area (Feature 1) was tested with two backhoe trenches (TR1 and TR2) and two 1x1 m hand excavation units (EU2 and EU3). A rock feature near the probable location of the historic diversion dam was tested by hand excavation unit EU1). The surface artifact scatter (Feature 3) was tested by a backhoe trench (TR3) primarily oriented to test the Rock Point Ditch (Site 894-2). Redeposited artifacts visible in a recent cut made in the berm of the Rock Point Ditch were tested with trench TR4, that also had as it's primary goal testing of the Rock Point Ditch. The artifact scatter in the south portion of the site was tested by means of three hand excavation units, EU4 to EU6.
* 9. **Summary of Artifacts and Debris:** Glass, metal, cut and wire nails, bone, ceramics, fabric, leather, wire, cans, wood, rubber, domestic items, car/car parts, etc.
Describe: Mill-related artifacts were all found subsurface in the mound (Feature 1). The stratigraphic situation is described by Reno and Clay (1996). Artifacts diagnostic of the first phase of milling are two large arrastra stones. These stones were part of pavement of one or two of the arrastras. Based on curved striations on the upper surfaces the arrastras were at least 8 ½ ft in diameter. A distinctive boss from a Washoe pan muller shoe confirms presence of a pan mill, although the part is to fragmentary to confirm that it came from a flat-bottomed Wheeler Pan as indicated by documents. Other mill-related items were in a jumble. Most of the mound includes architectural materials (rock, brick, cut spikes, large timber fragments) in total disarray. In the matrix is also remains of lighting fixtures (lamp chimneys) and small numbers of domestic items such as bottles and IWE. Most wood artifacts were unidentifiable, but one barrel was preserved. Carboy fragments and remnants of copper plates occur in several locations in the mound. A lens of intensely burned materials includes many cut nails and molten glass fragments.

Feature 3 is an artifact concentration in a bladed area. These highly fragmented artifacts include cut nails, glass, and ceramics. One mule shoe was found on the surface in this area and another was found subsurface. Where observed on the surface, testing showed this deposit to be surficial, however in depressions it has been redeposited and preserved subsurface. None of these artifacts appear to be in their original place of deposition.

Feature 4 is an artifact concentration exposed in the berm of the Rock Point Ditch by a recent borrow pit. In addition to glass and ceramics there are leather and cut bone fragments.

Similar artifact classes are exposed on the surface in the southern half of the site, including glass, ceramics, bone, and brick fragments.

PART C - HISTORIC SITES

Site No:
Agency No:
Temp. No: 894-1

* **10. Ceramic Artifacts:**

Paste	Glaze/Slip	Decoration	Pattern	Vessel Forms	No. (all frags)
IWE				Serving plate	>50
IWE				Dinnerware	>1000
White earthenware		Undecorated, floral transfer		Serving platter, Dinnerware	3
Gray ironstone	clear			Crock	1
"	/brown			Bottle	1
Porcelain					1
Yellowware		Molded	Floral		3
Red earthenware		Molded	Ribbed		1 (in many frags)
" "	/Brown lead			Sewer pipe	20

***a. Estimated No. of Ceramic Trademarks:**
Describe: None observed

* **11. Glass:**

Quantity	Manufacture	Color	Function	Trademarks	Decoration
1		aqua	bottle side, octagonal		
3	mouth-blown molded	dark green	bottle, wine		
1	mouth-blown	aqua	oil finish		
1	mouth-blown molded	purple	liquor, picnic flask		
1	mouth-blown	brown	"blob" finish		
11		aqua	window		
1	pressed	cobalt blue			embossed
1	mouth-blown molded	purple	prescription finish		

Describe: Also fragments including >500 aqua, 6 cobalt, >50 brown, >50 green, >10 purple, 1 white.

12. Maximum Density-#/sq m (glass and ceramics): 20

* **13. Tin Cans:**

Type	Opening	Size	Modified	Label/Mark	Function

Describe: Due to extremely poor preservation, only unidentifiable rust fragments were found.

* **14. Landscape and Constructed Features (locate on site map):** Mill tailings (ML), Rock alignment (RA)
Describe: Mill tailings, probably from the nearby Birdsall Mill, were found subsurface in Trench TR4 in what seems to be a buried tailings pond. Other traces of mill tailings occur throughout the site subsurface. A rock alignment (Feature 2) may be remains of the mill dam, or may simply be remains of some riprap to control the Carson River.

PART C - HISTORIC SITES

Site No:
Agency No:
Temp. No: 894-1

15. Buildings and Structures (locate on site map):

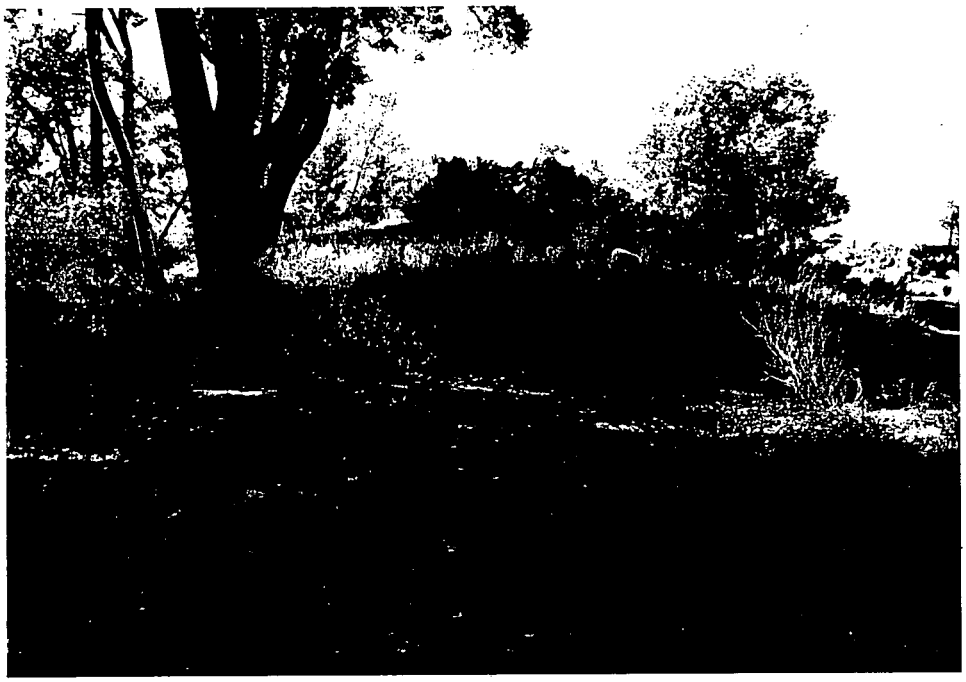
#	Material	Type	#	Material	Type

Describe: Although no foundations were found, the mound contains displaced structural members of the mill. If the mill was not actually located on the basal layer of the mound (composed of river terrace materials), it must have been located nearby.

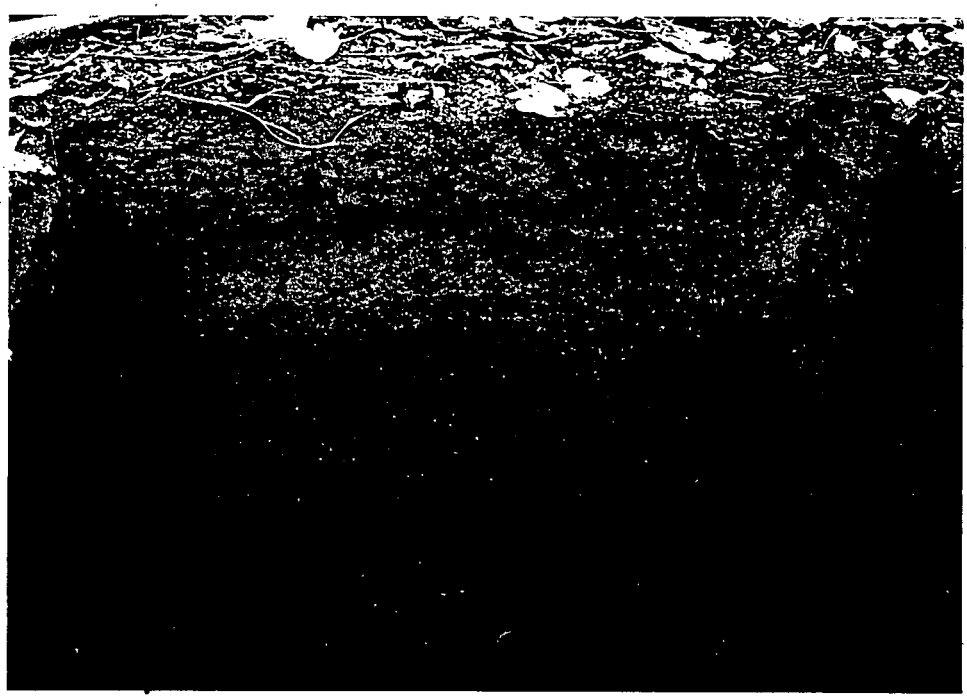
16. Comments/Continuations: (Please make note of any Historic Record searches performed (for example - County Records, General Land Office, Historical Society, Land Management Agency Records, Oral Histories/Interviews) Records search at Nevada State Museum, Lyon County Courthouse, Nevada State Library, Nevada Historical Society, ARS files, Dayton Library.

Additional data, including excavation profiles and a detailed catalog of materials from the test excavations, are in Reno and Clay (*Archaeological Evaluation of the Carson River Mercury Site at Dayton and Silver City, Nevada.* ARS Project 894).

ARS Project No. 894, Site 894-1,
Carson River Mercury Project, Lyon County, Nevada

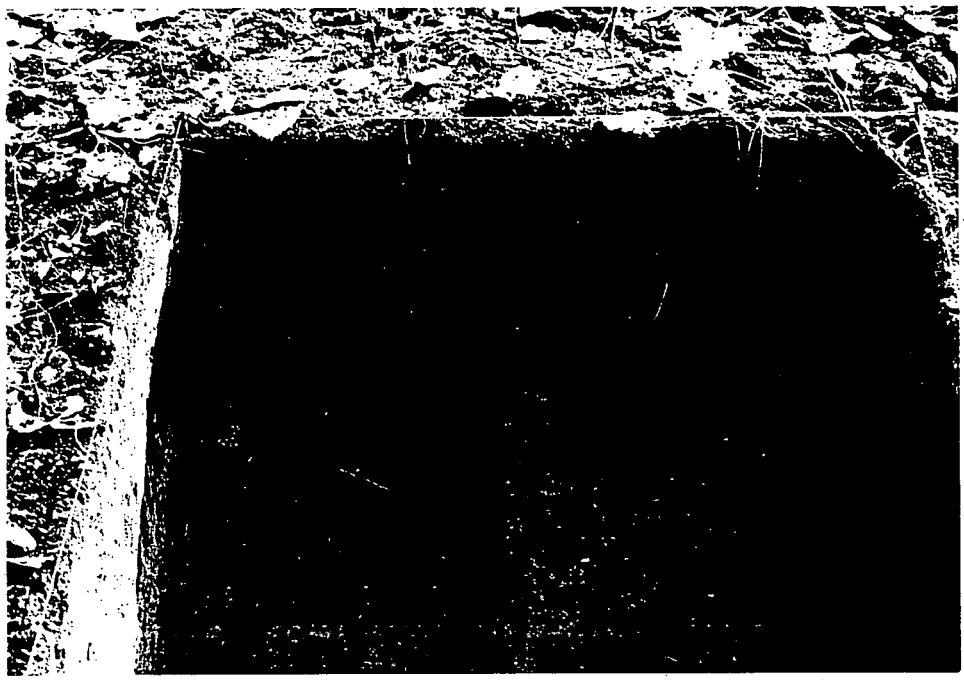


Roll ARCP 431, fr. 3, 11-4-96: Mound overview, Feature 1, 220°.

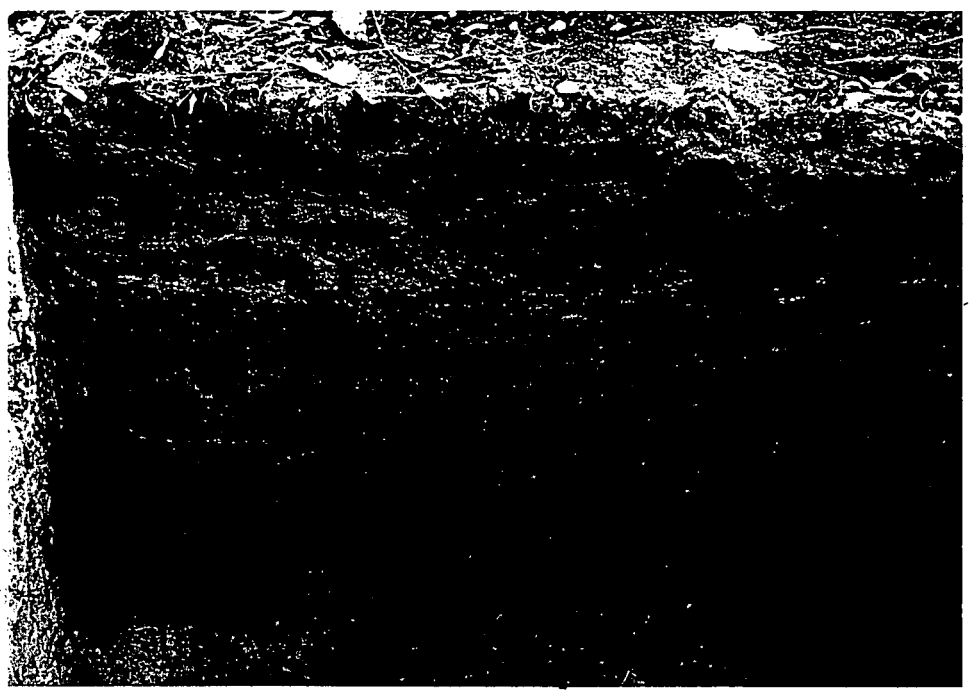


Roll ARCP 458, fr. 6, 11-15-96: EU6 final, north.

ARS Project No. 894, Site 894-1,
Carson River Mercury Project, Lyon County, Nevada



Roll ARCP 458, fr. 2, 11-14-96: EU5 final, 0-40 cm bs, south.



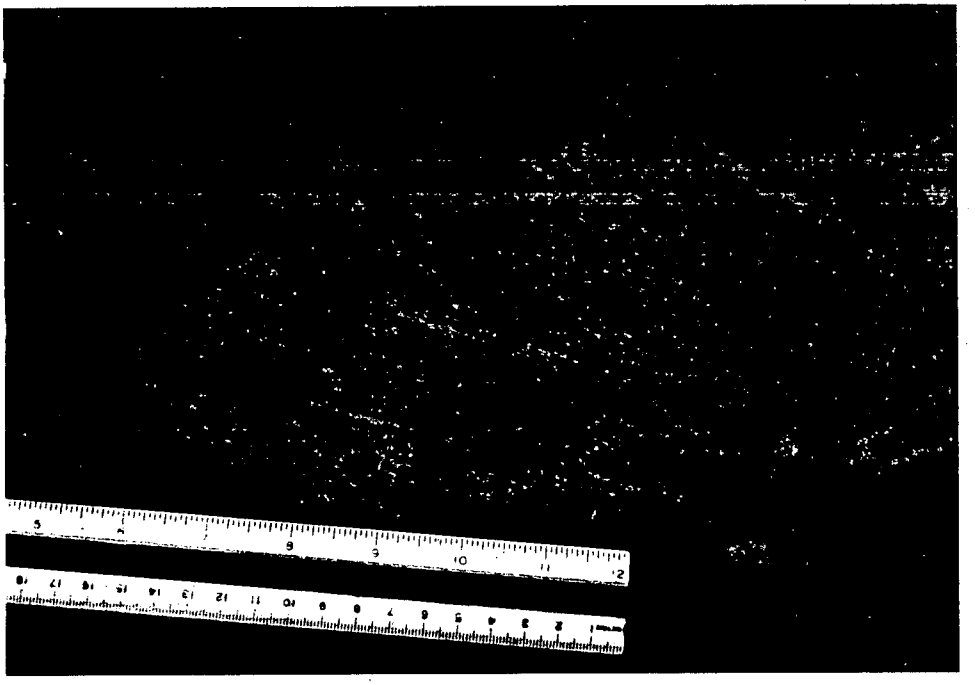
Roll ARCP 458, fr. 5, 11-15-96: EU6 final, east.

ARS Project No. 894, Site 894-1,
Carson River Mercury Project, Lyon County, Nevada

Roll VC1, fr. 9, 11-8-96: Trench 1 overview, Feature 1-1 in foreground, north.

Roll VC1, fr. 20, 11-8-96: EU2, Stratum 5, Feature 1-2, with beams, north.

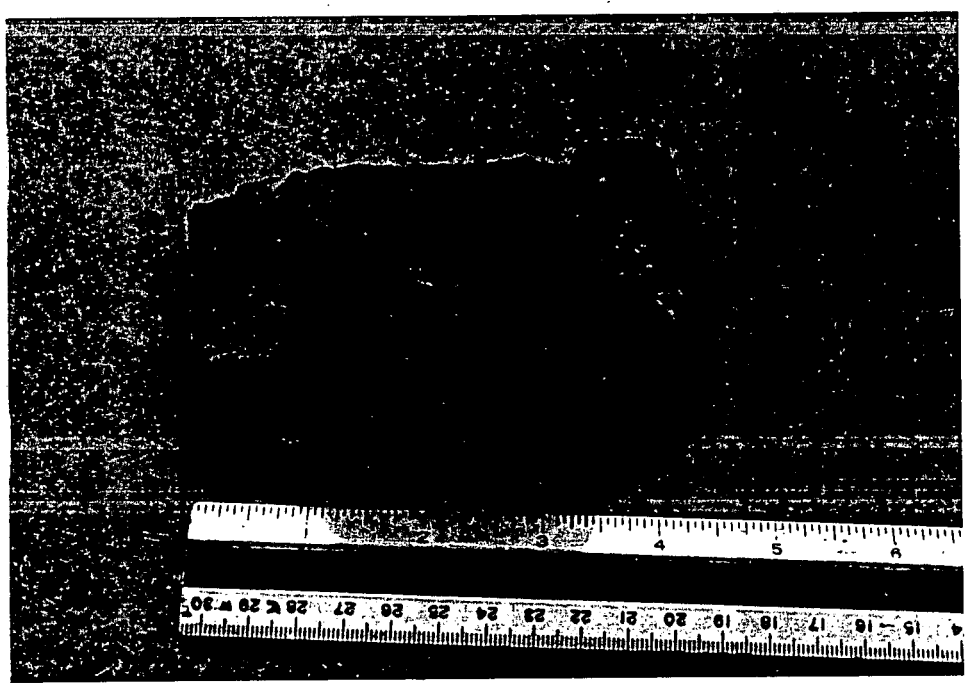
ARS Project No. 894, Site 894-1,
Carson River Mercury Project, Lyon County, Nevada



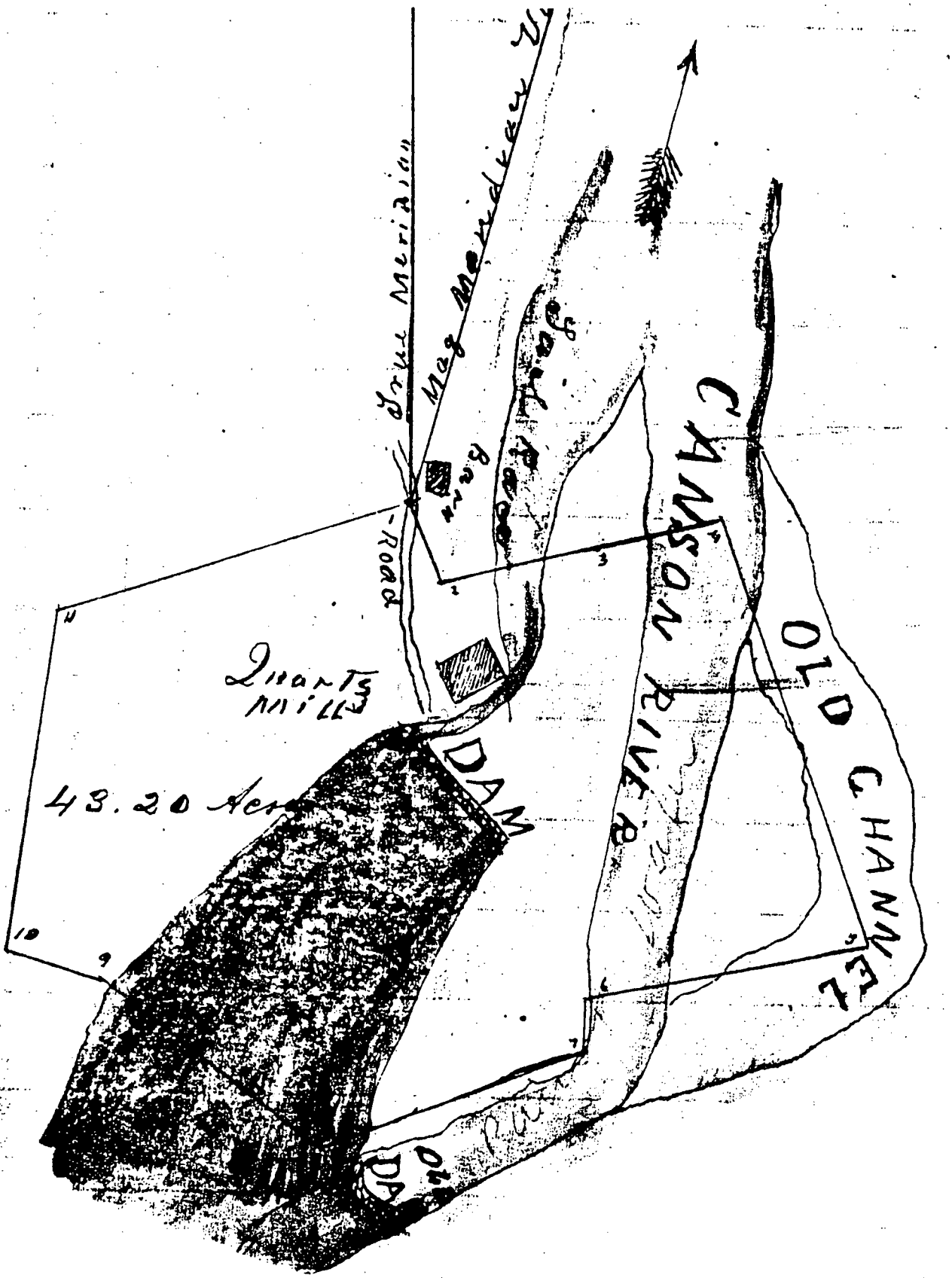
Roll VC1, fr. 29, 11-8-96: Feature 2: Arrastra stone, close-up of grooves.

Roll VC1, fr. 33, 11-12-96: EU3, Feature 1-1, north wall final photo, north.

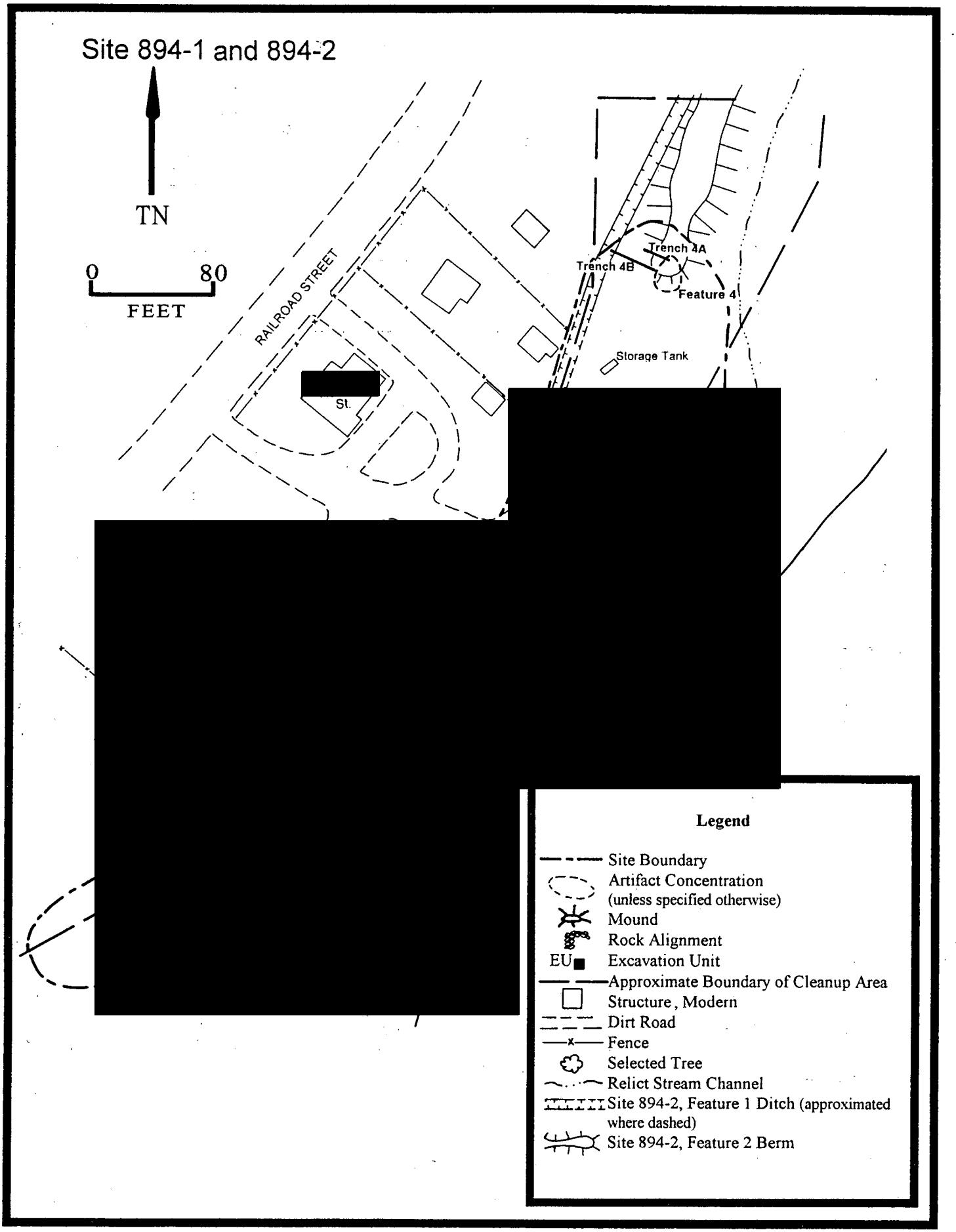
ARS Project No. 894, Site 894-1,
Carson River Mercury Project, Lyon County, Nevada



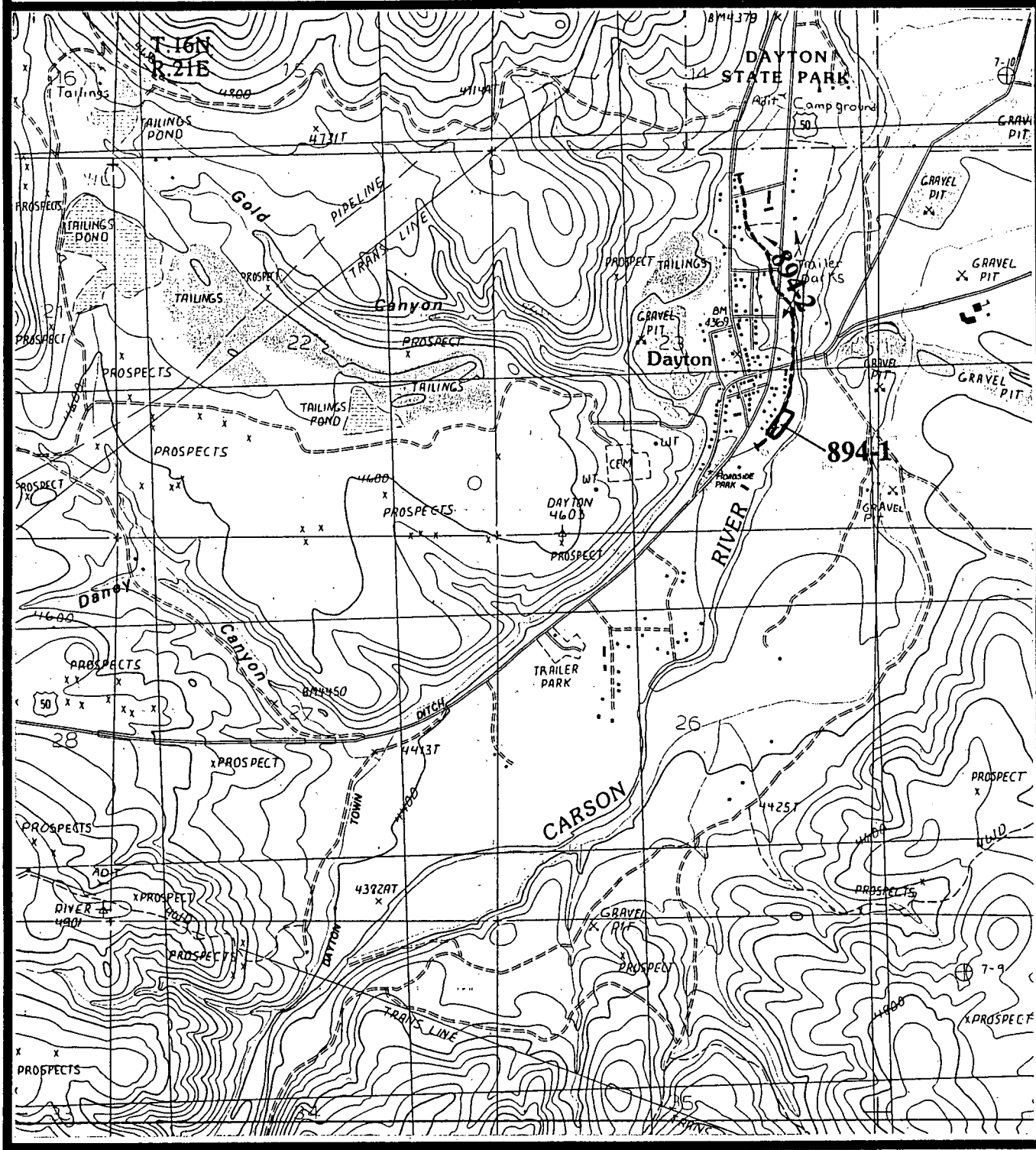
Roll VC1, fr. 37, 11-14-96: Washoe pan shoe from EU2, Stratum 13.



Site 894-1 Keller and Company millsite surveyed on Nov. 20, 1862 for Lindauer, Hirschman, and Sweetapple (Surveys A:209). Plat has been enlarged.


Site 894-1 and 894-2
TN
0
80
FEET
RAILROAD STREET
St.
Trench 4A
Trench 4B
Feature 4
Storage Tank
Legend
Site Boundary
Artifact Concentration
(unless specified otherwise)
Mound
Rock Alignment
EU
Excavation Unit
Approximate Boundary of Cleanup Area
Structure, Modern
Dirt Road
Fence
Selected Tree
Relict Stream Channel
Site 894-2, Feature 1 Ditch (approximated
where dashed)
Site 894-2, Feature 2 Berm

Site Location Map



.0 .5 1.0 Miles

.0 .5 1.0 Kilometers

Archaeological Research Services, Inc.

Project No: ARS 894
County: Lyon
Map: Dayton, Nev. Prov. Ed. 1987
Scale: 1:24,000

N

1990

IMACS ENCODING FORM

To be completed for each site form.
For instructions and codes, see IMACS Users Guide.

Encoder's Name D. Mathews
894-1

A

1 ___ - ___ - ___ State Site Number

2 ___ - ___ Agency Site Number

6 ___ Agency Report Number

10 Elevation: 4360

11 Zone: 11 Easting: 276620 Northing: 4345750

12 1/4: SE; 1/4: NW; 1/4: SE; Sec.: 23; T.: 16 N; R.: 021 E

13 Meridian: 7

14 USGS Map: DAYTON NEV 7.5' 1987

17 Owner: PR

18 Forest ___ Dist./Park ___

19 Loc. Curated Materials ___

21 Cond.: D

22 Impacts: ER DM OT

23 N.R.: D

26 Organ.: AR

28 Survey Date: 11-04-96

29 Slope: 04 Aspect: 100

30 Water: distance/type: 000 B

31 Geog. Unit: BMD

32 Topographic Location: 1st E 2nd J

33 Dep.: D

34 Vegetation: 1 2 3 E PUL

35 Misc. Text, Site Name: KELLER TO COMILL

B

2 Culture/Dating Method ___

3 Area ___

4 Collect ___

5 Depth ___

6 Excav. Status ___

7 Prehistoric Artifacts ___

8 Lithic Tools: # / type ___

9 # ___ Flaking Stages ___

11 Ceramics: # / type ___

13 Features: # / type ___

14 Architecture: # / material / type ___

C

2 Historic Themes: MN ___

3 Cultures / Dating Method: EAI EAF

4 Dates: 1861 1866

5 Area: 09032

6 Collect.: A

7 Depth: D

8 Excav. Status: B

9 Artifacts: GL ME NC; NW CS LE; WF WD CR

14 Features: # / type: ML 1 RA ___

15 Architecture: # / material / type ___

IMACS SITE FORM

PART A - ADMINISTRATIVE DATA

Intermountain Antiquities Computer System

***1. State No:**
***2. Agency No:**
3. Temp. No: 894-2

4. **State:** Nevada **County:** Lyon
5. **Project:** Carson River Mercury Project (ARS #894)
* 6. **Report No:**
7. **Site Name:** Rock Point Ditch
8. **Class:** Historic
9. **Site Type:** Mill Ditch
* 10. **Elevation:** 4360 ft.
* 11. **UTM Grid Zone:** 11 276620 **m E** 4345750 **m N**
* 12. SE¼ of NW¼ of SE¼ **of Section** 23 **T.**16N, **R.**21E at study area
SW¼ of SW¼ of SW¼ **of Section** 23 **T.**16N, **R.**21E at origin of ditch on Carson River
NE¼ of NW¼ of NE¼ **of Section** 23 **T.**16N, **R.**21E at outlet into mill reservoir
* 13. **Meridian:** Mt. Diablo
* 14. **Map Reference:** USGS Dayton Nev.7.5', 1987; Piedmont Engineering 1"=40'
15. **Aerial Photo:**
16. **Location and Access:** The portion of the ditch in the study area is in the backyard of [redacted], in Dayton. The origin of the ditch is accessible from [redacted] at the south end of Dayton, about 0.1 mile south of where [redacted] The northern terminus of the ditch is in the prominent reservoir at the north end of Dayton, near the corner of [redacted]
* 17. **Land Owner:** Private, multiple owners. The segment tested in the study area is on property owned by the [redacted]
* 18. **Fed. Admin. Units:**
* 19. **Location of Curated Materials:** No collections were made.
20. **Site Description:** The Rock Point Ditch provided water for the Rock Point Mill that processed Comstock ores from 1861 to the 1930s. During most of this time the ditch originated at a diversion dam just north of the bridge over the Carson River in Dayton. It was an unlined earthen ditch from this point to the vicinity of the mill reservoir on the north end of Dayton, just north of East Pike Street. The portion of the ditch near the reservoir was contained in an eight-foot wide wood box flume. Around the turn of the century the ditch was extended upstream (south) to double its length. A relic meander of the Carson River made a convenient reservoir between the new head gate and start of the ditch proper, as shown on the site map. The portion of the ditch in the current study area is within this later extension of the ditch. Two backhoe trenches across the ditch indicate that here it is unlined and was about 5 m wide and 1.45 m deep before collapsing and being largely covered by fill (Feature 1). Remnants of a dike composed partly of ditch cleanout exist between the ditch and the Carson River (Feature 2). Fragments of 19th century artifacts within the berm support the notion that this portion of the ditch was constructed in the late 19th to early 20th century.
* 21. **Site Condition (A-excellent, B-good, C-fair, D-poor):** Poor.
* 22. **Impact Agents:** Many segments have been destroyed by landscape alterations for subsequent development in the townsite of Dayton. Portions of the ditch berm have been used as a borrow pit.
* 23. **Nat. Register Status (C-significant, D-non-significant, Z-unevaluated):** Non-significant.
Justify: A Comstock-related mill ditch system would be significant under criteria A, C, and D if in good condition. However, the integrity of this ditch has been extremely degraded due to its presence in the townsite of Dayton. Due to lack of integrity this site is not significant.
24. **Photos:** Roll VC1 fr. 19, 24, 30. Roll ARCP 431 fr. 7.
25. **Recorded by:** R. Reno

IMACS SITE FORM

PART A - ADMINISTRATIVE DATA

Intermountain Antiquities Computer System

***1. State No:**
***2. Agency No:**
3. Temp. No: 894-2

* **26. Survey Organization:** Archaeological Research Services, Inc. (AR), P.O. Box 701, Virginia City, Nevada 89440

27. Assisting Crew Members: V. Clay, L. Hause, T. Burke

* **28. Survey Date:** 11/4 to 15, 1996.

List of Attachments:

Part B	✔Topo Map
✔Part C	✔Site Sketch
✔Encoding Sheet	Artifact/Feature Sketch
✔Photos	Other

PART A - ENVIRONMENTAL DATA

Site No:
Agency No:
Temp. No: 894-2

* **29. Slope:** 1 **(degrees)** **Aspect** 360 **(degrees)**

* **30. Distance to Permanent Water:** 0 X 100 meters
Type of Water Source (A-spring/seep, B-stream/river, C-lake, D-other): River
Name of Water Source: Carson River

* **31. Geographic Unit:** Dayton Valley (BND)

* **32. Topographic Location:**
Primary Landform: Valley (E) **Secondary Landform:** Floodplain (J)
Describe: The ditch starts on the west bank of the Carson River, crosses the floodplain and low alluvial terraces supporting the town of Dayton, and terminates at a reservoir at the base of foothills on the west side of the Dayton Valley floor.

* **33. On-site Depositional Context:** Stream Terrace (D)
Description of Soil: In the portion of the site trenched, soil is gravelly sandy loam alluvium; mapped as Veta very gravelly sandy loam, map unit 701 by Archer (*Soil Survey of Lyon County Area, Nevada* 1984)

* **34. a. Life Zone: Upper Sonoran**
b. Community: **Primary On-Site:** Tall Sagebrush (P)
Secondary On-Site: Riparian (L)
Surrounding Site: Agricultural (U)

Describe: In the study area big sagebrush and cottonwood trees are dominant overstory. Disturbance plants such as Russian thistle, goathead, mustard, and grasses completely cover areas not recently bladed.

* **35. Miscellaneous Text:**

36. Comments/Continuations/Location of Curated Materials and Records:

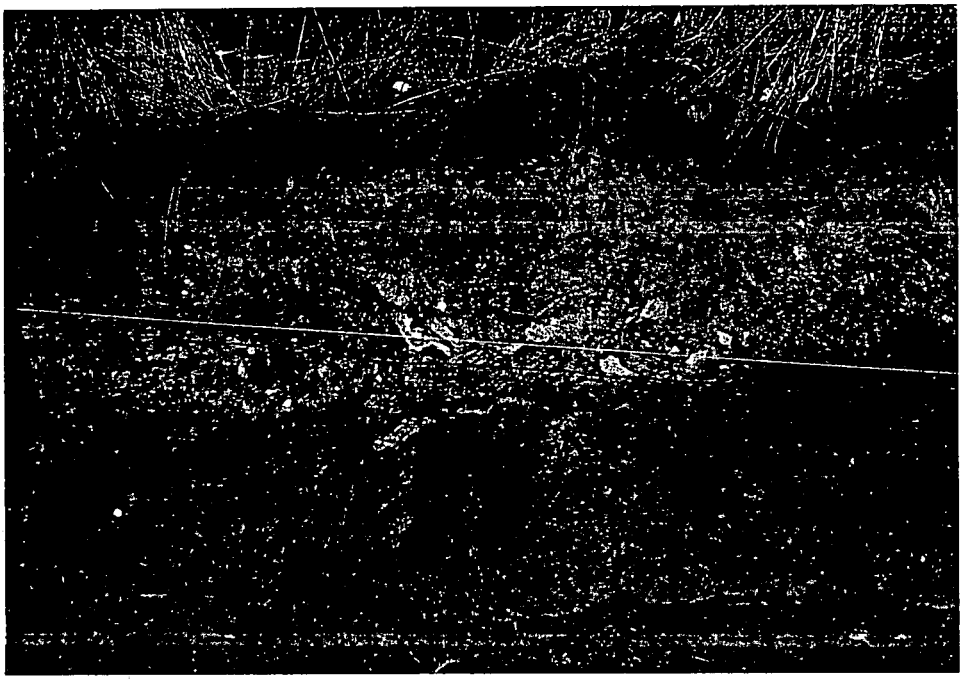
PART C - HISTORIC SITES

Site No:
Agency No:
Temp. No: 894-2

1. **Site Type:** Ditch
* 2. **Historic Theme(s):** Metals milling, water management.
* 3. **Culture:**
Affiliation: Euro-American (EA) **Dating:** Documents (I)
* 4. **Oldest Date:** 1861 **Recent Date:** 1930s
How Determined?: Documents indicate the expanded Rock Point Mill opened in 1861. The mill may have operated (or was capable of operation) until the closure of such properties with onset of WWII.
* 5. **Site Dimensions:** 6 m x 1760 m ***Area:** 10,560 **sq m**
Site width varies from about 3 m in simple ditch areas to wider where bermed or in areas of gates.
* 6. **Surface Collection/Method: (A-None, B-Grab sample, C-Designed sample, D-Complete collection):** None.
Sampling Method:
* 7. **Estimated depth of fill: (A-surface, B-0-20 cm, C-20-100 cm, D-100 cm +, E-fill noted but unknown), F-Depth suspected but not tested):** 100 cm +.
How Estimated (if tested, show location on site map): Two trenches (TR3 and TR4) crosscut ditch.
* 8. **Excavation Status: (A-Excavated, B-Tested, C-Unexcavated):** Tested
Testing Method: Two backhoe trenches (TR3 and TR4) excavated to maximum four ft. below grade. In addition, part of TR4 extends to section the dike.
* 9. **Summary of Artifacts and Debris:** No ditch-related artifacts were found. Artifacts in sediments dug through by the ditch or in subsequent filling episodes are described as part of Site 894-1.
Describe:
* 10. **Ceramic Artifacts:**
Paste Glaze/Slip Decoration Pattern Vessel Forms No.
***a. Estimated No. of Ceramic Trademarks:**
Describe:
* 11. **Glass:**
Quantity Manufacture Color Function Trademarks Decoration
Describe:
12. **Maximum Density-#/sq m (glass and ceramics):**
* 13. **Tin Cans:**
Type Opening Size Modified Label/Mark Function
Describe:
* 14. **Landscape and Constructed Features (locate on site map):** Ditch (DI); Other, Dike (OT)
Describe: See site description. Detailed treatment of subsurface data from testing is in Reno and Clay (1996).
15. **Buildings and Structures (locate on site map):**
 # Material Type # Material Type
Describe:

16. **Comments/Continuations: (Please make note of any Historic Record searches performed (for example - County Records, General Land Office, Historical Society, Land Management Agency Records, Oral Histories/Interviews)** Records search at Nevada State Museum, Lyon County Courthouse, Nevada State Library, Nevada Historical Society, ARS files, Dayton Library.

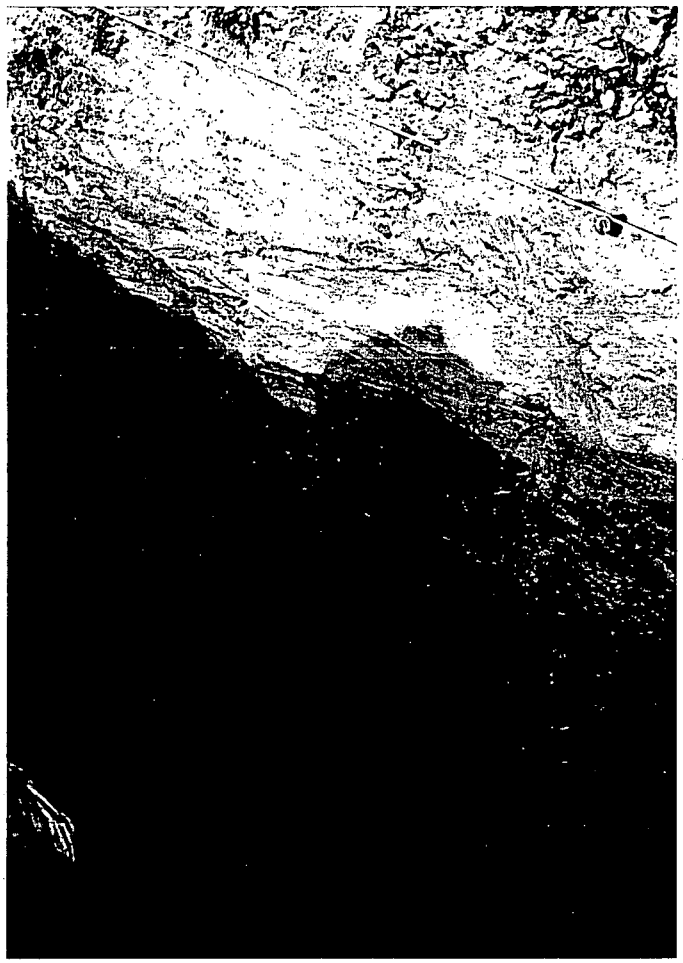
Additional data are in Reno and Clay (*Archaeological Evaluation of the Carson River Mercury Site at Dayton and Silver City, Nevada.* ARS Project 894.)



Roll VC1, fr. 19, 11-8-96: Trench 4A, Dike Feature: Close-up of west side, north.

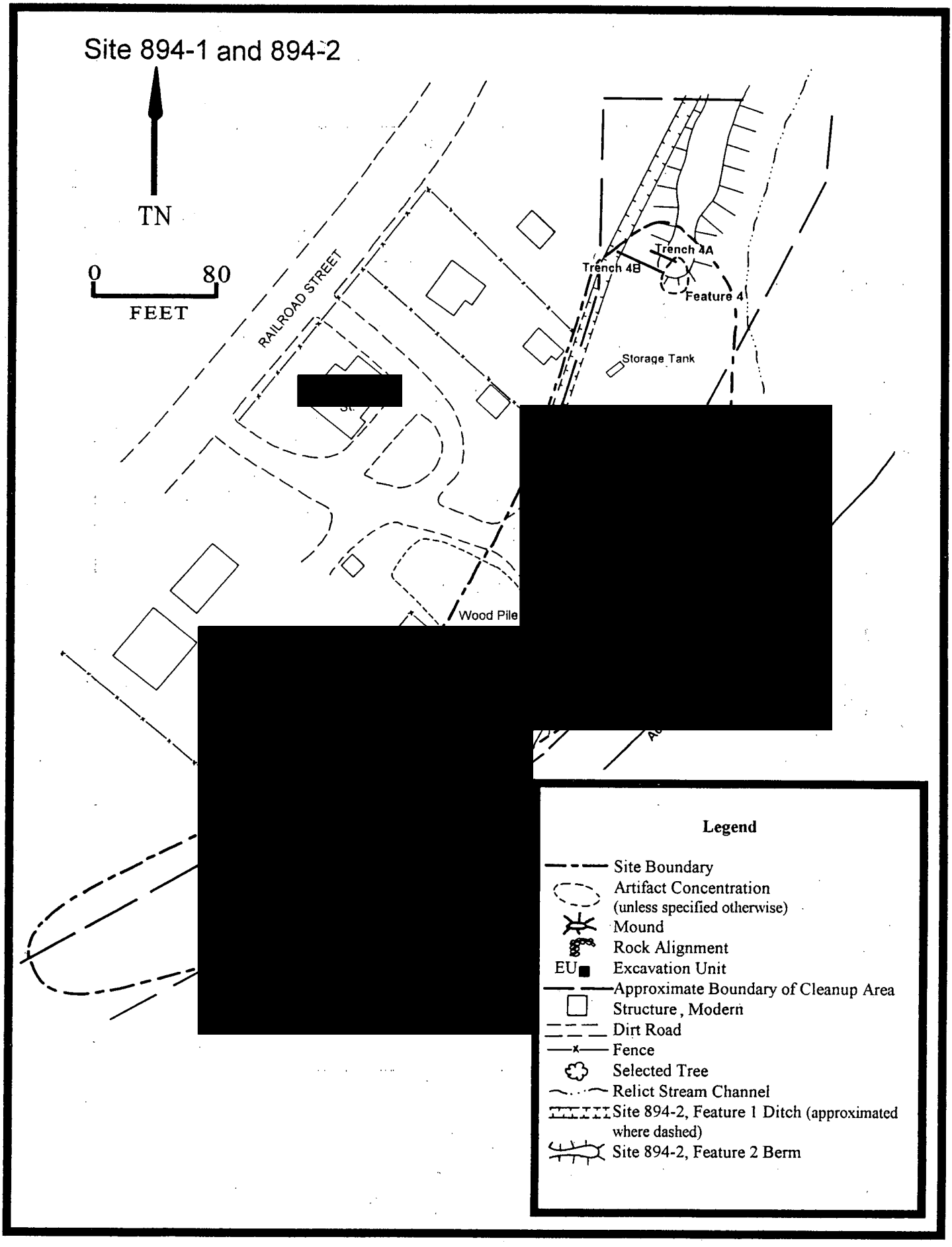
Roll VC1, fr. 24, 11-8-96: Trench 4B: Ditch cross-cutting mill pond tailings, north.

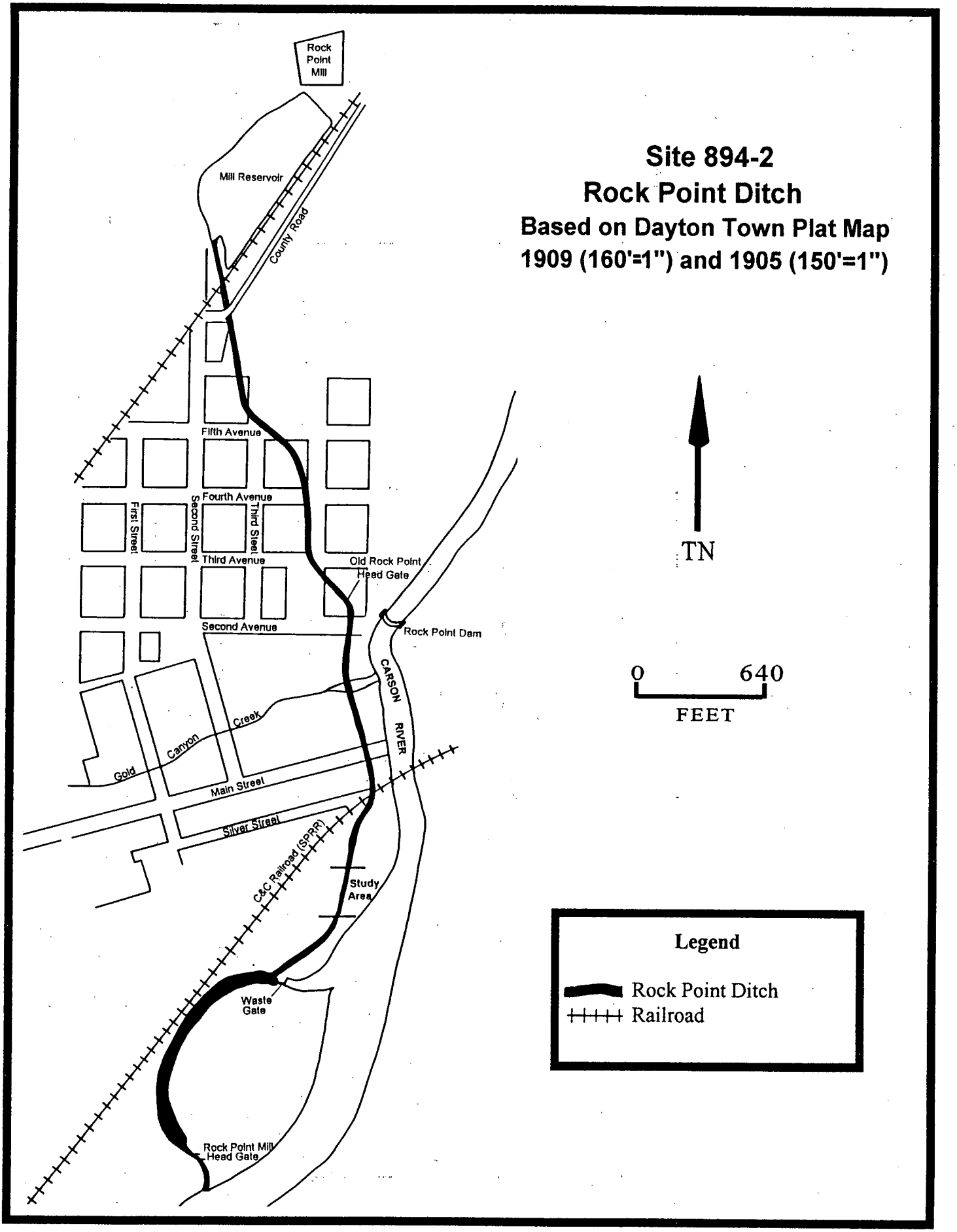
ARS Project No. 894, Site 894-2,
Carson River Mercury Project, Lyon County, Nevada



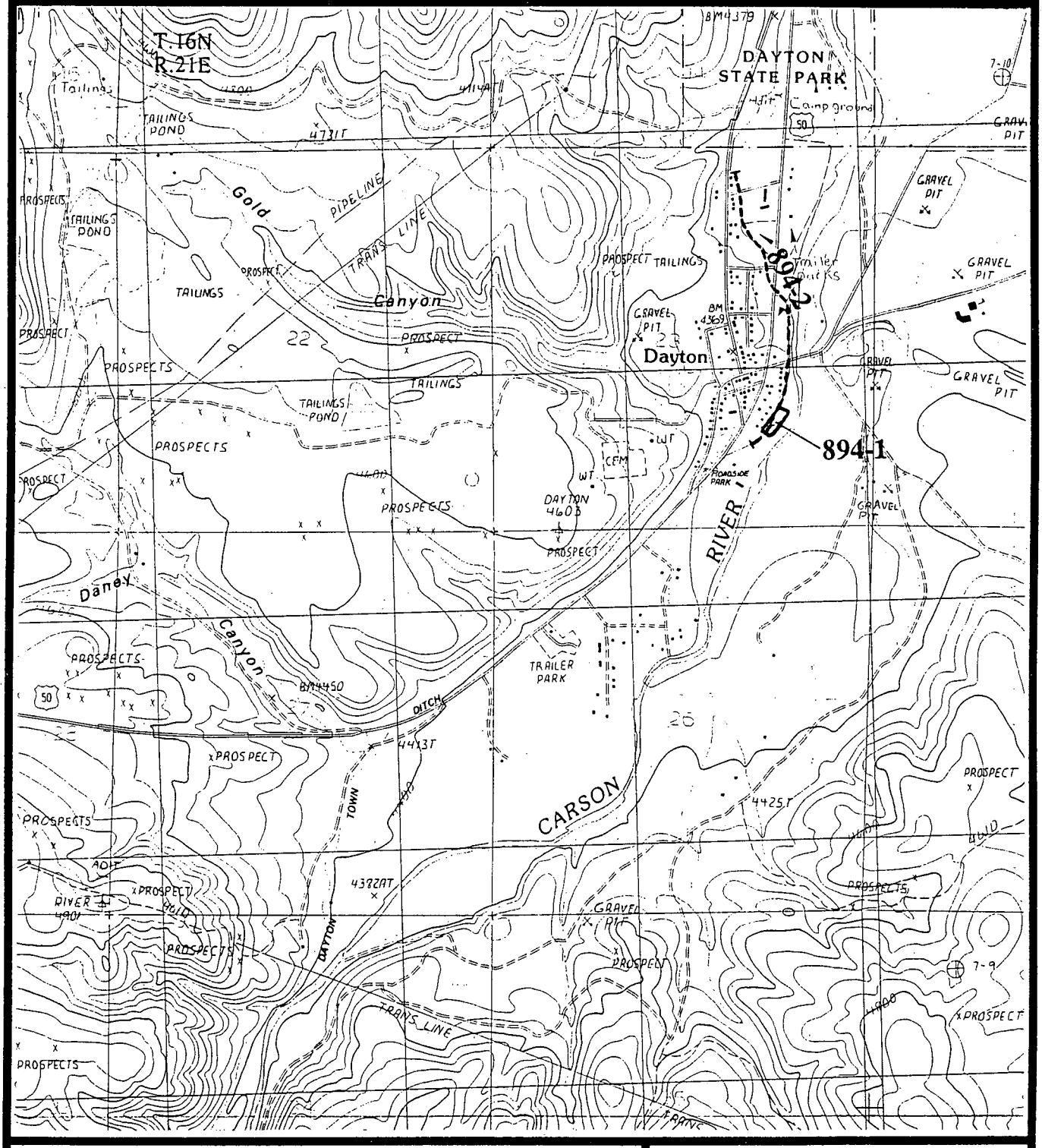
Roll VC1, fr. 30, 11-11-96: Trench 4B: Close-up at 5 m, north.

Roll ARCP431, fr. 7, 11-4-96: Rock Point Ditch near south end dike, 180°.


Site 894-1 and 894-2
TN
0
80
FEET
RAILROAD STREET
Trench 4A
Trench 4B
Feature 4
Storage Tank
Wood Pile
Legend
Site Boundary
Artifact Concentration
(unless specified otherwise)
Mound
Rock Alignment
EU
Excavation Unit
Approximate Boundary of Cleanup Area
Structure, Modern
Dirt Road
Fence
Selected Tree
Relict Stream Channel
Site 894-2, Feature 1 Ditch (approximated where dashed)
Site 894-2, Feature 2 Berm


Site 894-2
Rock Point Ditch
Based on Dayton Town Plat Map
1909 (160'=1") and 1905 (150'=1")
Rock Point Mill
Mill Reservoir
County Road
Fifth Avenue
Fourth Avenue
First Street
Second Street
Third Street
Third Avenue
Old Rock Point Head Gate
Second Avenue
Rock Point Dam
CARSON RIVER
Creek
Canyon
Gold
Main Street
Silver Street
C&C Railroad (SPRR)
Study Area
Waste Gate
Rock Point Mill Head Gate
TN
0
640
FEET
Legend
Rock Point Ditch
Railroad

Site Location Map



.0 .5 1.0 Miles

.0 .5 1.0 Kilometers

Archaeological Research Services, Inc.

Project No: ARS 894
County: Lyon
Map: Dayton, Nev. Prov. Ed. 1987
Scale: 1:24,000

N

IMACS ENCODING FORM

To be completed for each site form.
For instructions and codes, see IMACS Users Guide.

1990

Encoder's Name D. Mathews
894-2

A

1 [ ]-[ ]-[ ] State Site Number

2 [ ]-[ ] Agency Site Number

6 [ ] Agency Report Number

10 [Ø,4,3,6,Ø] Elevation

11 [1,1] Zone [2,7,6,6,2,Ø] Easting [4,3,4,5,7,5,Ø] Northing

12	1/4	1/4	1/4	Sec.	T.		R.	
	S,E	N,W	S,E	2,3	1,6	N	Ø,2,1	E
	S,W	S,W	S,W	2,3	1,6	N	Ø,2,1	E
	N,E	N,W	N,E	2,3	1,6	N	Ø,2,1	E

13 [M] Merid.

14 [D,A,Y,T,O,N, ,N,E,V, ,7.5', ,1,9,8,7] USGS Map

17 [P,R] Owner

18 [ ][ ] Forest / Dist./Park

19 [ ] Loc. Curated Materials

21 [D] Cond.

22 [P,R] [D,T] [ ] Impacts

23 [D] N.R.

26 [A,R] Organ.

28 [1,1]-[Ø,4]-[9,6] Survey Date

29 [Ø,1] Slope

[3,6,Ø] Aspect

30 [Ø,Ø,Ø] [B] Water: distance/type

31 [B,N,D] Geog. Unit

32 [E] [ ] Topographic Location 1st 2nd

33 [D] Dep.

34 [E] [P] [L] [U] Vegetation 1 2 3

35 [R,O,C,K, ,P,O,I,N,T, ,D,I,T,C,H] Misc. Text, Site Name

B

2 [ ][ ] Culture/Dating Method

3 [ ] Area

4 [ ] Collect

5 [ ] Depth

6 [ ] Excav. Status

7 [ ][ ][ ][ ][ ][ ] Prehistoric Artifacts

8 [ ][ ] Lithic Tools: # / type

9 [ ] # [ ][ ][ ][ ][ ] Flaking Stages

11 [ ][ ][ ] Ceramics: # / type

13 [ ][ ][ ][ ] Features: # / type

14 [ ][ ][ ][ ][ ][ ] Architecture: # / material / type

C

2 [W,W] [ ] Historic Themes

3 [E,A,I] [ ][ ] Cultures / Dating Method

4 [1,8,6,1] [1,9,3,0] Dates

5 [1,Ø,5,6,Ø] Area

6 [A] Collect.

7 [D] Depth

8 [B] Excav. Status

9 [ ][ ][ ] Artifacts

14 [1] [D,I] [1] [O,T] [ ][ ] Features: # / type

15 [ ][ ][ ] [ ][ ][ ] [ ][ ][ ] [ ][ ][ ] [ ][ ][ ] [ ][ ][ ] Architecture: # / material / type

IMACS SITE FORM

PART A - ADMINISTRATIVE DATA

Intermountain Antiquities Computer System

***1. State No:**
***2. Agency No:**
3. Temp. No: 894-3

4. **State:** Nevada **County:** Lyon
5. **Project:** Carson River Mercury Project (ARS #894)
* 6. **Report No:**
7. **Site Name:**
8. **Class:** Historic
9. **Site Type:** Trash Dump
* 10. **Elevation:** 5000 ft.
* 11. **UTM Grid Zone:** 11 272000 **m E** 4348880 **m N**
* 12. NW¼ of SE¼ of SE¼ **of Section** 8 **T.**16N, **R.**21E
* 13. **Meridian:** Mt. Diablo
* 14. **Map Reference:** Virginia City, 1967, USGS Nev.7.5'; Piedmont Engineering 1"=10 ft.
15. **Aerial Photo:**
16. **Location and Access:** From the intersection of SR341 and SR342 on the south end of silver City, follow SR342 N 0.3 miles; turn west on the American Ravine Road. Site is [redacted])
* 17. **Land Owner:** [redacted])
* 18. **Fed. Admin. Units:**
* 19. **Location of Curated Materials:** No collections were made.
20. **Site Description:** The site is a small concentration of historic debris. Although a few artifacts are consistent with attribution to the boom period of the Comstock, by far most artifacts date to the 1950s or later. Most artifacts are domestic refuse such as food and beverage containers. A few industrial artifacts are present, including cut spikes and remnants of a large wooden vat. The vat is clearly a late addition to the site, and lies on top of domestic debris. Due to its position by the road, the debris could either be hauled from the main portion of Silver City or could have been generated by nearby households along American Ravine. The debris lies on a human-created bench along the side of the ravine. This bench contains remnants of mill tailings from a mill uphill of the site. It also contains rock from a nearby mine waste rock dump.
* 21. **Site Condition (A-excellent, B-good, C-fair, D-poor):** Poor.
* 22. **Impact Agents:** At least 10 cm have been recently bladed off the top of the site.
* 23. **Nat. Register Status (C-significant, D-non-significant, Z-unevaluated):** Non-significant.
Justify: Although a few artifacts date to the 19th century and many barely 50 years old, they are entirely surrounded by a mix of later objects. It is not possible to identify an early assemblage that could be confidently associated with a domestic household in American Ravine. There is no reason to consider the site significant under criteria A-C. Due to lack of focus in the assemblage and lack of definite historic context for the debris this site does not have the potential for contributing toward domestic lifeways/consumerism under Criterion D.
24. **Photos:** Overview included in site form; ARCP 431:11-15 on file.
25. **Recorded by:** R. Reno
* 26. **Survey Organization:** Archaeological Research Services, Inc. (AR), P.O. Box 701, Virginia City, Nevada 89440
27. **Assisting Crew Members:** V. Clay, L. Hause
* 28. **Survey Date:** 11/4-5/1996

List of Attachments:

Part B	✔ Topo Map
✔ Part C	✔ Site Sketch
✔ Encoding Sheet	✔ Artifact/Feature Sketch
✔ Photos	Other

PART A - ENVIRONMENTAL DATA

Site No:
Agency No:
Temp. No: 894-3

* **29. Slope:** 6-10 **(degrees)** **Aspect** 25 **(degrees)**

* **30. Distance to Permanent Water:** 0.3 X 100 meters
Type of Water Source (A-spring/seep, B-stream/river, C-lake, D-other): Stream/River
Name of Water Source: Unnamed

* **31. Geographic Unit:** Dayton Valley (BND)

* **32. Topographic Location:**
Primary Landform: Valley (E) **Secondary Landform:** Terrace/bench (R)
Describe: The site is on the south side of the creek and appears to be a historically built terrace or bench made partly of what appear to be mill tailings. At least some of the material is unprocessed mine waste rock up to the size of small boulders.

* **33. On-site Depositional Context:** Stream Terrace (D)
Description of Soil: Archer (1994:64) describes the local soil as Unit 471, Oppio-Nosrac association. On north-facing slopes such as this site, soil is Nosrac grayish brown stony clay loam formed from colluvium derived from andesite or basalt. In addition, possible mill tailings have been exposed on site. These are poorly sorted very pale brown (10YR8/4 dry to 10YR7/4 moist) silt loam.

* **34. a. Life Zone: Upper Sonoran**
b. Community: **Primary On-Site:** Tall sagebrush (P)
Secondary On-Site: Same
Surrounding Site: Riparian nearby (L)

Describe: Big sagebrush, desert peach, rabbitbrush, mustards, thistles, grasses, horehound. Site was originally covered by dense sage, but nearly all vegetation has been bladed off.

* **35. Miscellaneous Text:** Archer (1994) *Soil Survey of Lyon County Nevada*; Most bottle dates from Giarde (1980) *Glass Milk Bottles: Their Makers and Marks*.

36. Comments/Continuations/Location of Curated Materials and Records:

PART C - HISTORIC SITES

Site No:
Agency No:
Temp. No: 894-3

1. **Site Type:** Secondary trash dump.
* 2. **Historic Theme(s):** Domestic lifeways, consumer behavior.
* 3. **Culture:**
Affiliation: Not identified **Dating:**

* 4. **Oldest Date:** ca. 1870s **Recent Date:** Present
How Determined?: Oldest date from hand-tooled pushup on cylindrical bottle. Large cut spikes also of 19th century. 1935 licence plate (Nevada). Most datable bottle marks are from mid-1940s. Additional goods include 1930s-1950s bottle marks, paper dated 1951, and many obviously 1950s or later disposable goods such as toothpaste tubes.
* 5. **Site Dimensions:** 26m x 26 m ***Area:** 530 **sq m**

* 6. **Surface Collection/Method: (A-None, B-Grab sample, C-Designed sample, D-Complete collection):** None.
Sampling Method:
* 7. **Estimated depth of fill: (A-surface, B-0-20 cm, C-20-100 cm, D-100 cm +, E-fill noted but unknown), F-Depth suspected but not tested):** Depth suspected but not tested
How Estimated (if tested, show location on site map): At least 20 cm of fill have been removed by recent blading. Since the terrace has been at least partly built up from mill/mine deposits total depth of cultural fill may exceed 100 cm on the downhill side of the terrace.

* 8. **Excavation Status: (A-Excavated, B-Tested, C-Unexcavated):** Unexcavated.
Testing Method:

* 9. **Summary of Artifacts and Debris:** Glass, metal, cut and round nails, bone, ceramics, leather, wire, cans, wood, rubber, domestic items, kitchen utensils, wagon parts, etc.
Describe: Square point shovel frag., two frags. cut bone, four large cut spikes, 1 cut nail, over 100 round nails, iron wagon axle thimble, 1" twisted wire rope tow cable, wood composite tank hoops constructed with wire nails, 2 large bolts, overall buckle, many shoes (mens, womens, childrens, leather, leather and plastic), gray granite pot lid and spatula, tooth paste tubes, costume jewelry pin, overall buckle, many other items not tabulated due to high volume of artifacts.

* 10. **Ceramic Artifacts:**

Paste	Glaze/Slip	Decoration	Pattern	Vessel Forms	No.
White utility ironstone	salt	none		Cyl. bottle, prob. ale	1 (3 frags)
Gray utility ironstone	salt and brown glaze			Cyl. bottle, prob. ale	1
Misc. IWE and white earthenware					>1000
	many polychrome patterns in transfer & gold leaf/mostly dinnerware, some serving vessels				
"	white earthenware "				

***a. Estimated No. of Ceramic Trademarks:** 1 observed.
Describe: mark: PORT DUNDAS POTTERY C[OY.] GLASGOW (post-1866)

PART C - HISTORIC SITES

Site No:
Agency No:
Temp. No: 894-3

*** 11. Glass:**

Quantity	Manufacture	Color	Function	Trademarks	Decoration
9	Machine	Clear	½ Pint Liquor	Desc. below	
1	"	Brown	Liquor		
1	Mouth-blown, Hand pushup	Dark Green	Alcoholic Beverage		
1	Pressed	Green/White	Plate	"True King Ovenware Made in USA"	
1	Pressed	Clear	Stopper		Fluted design.
6	-	Aqua	Window		

Describe: [The Owens Illinois I in diamond and ellipse mark is referenced here as {OI}; the Owens dot in place of the I is referenced as {O}] Also, fragments include 2 aqua, 3 cobalt blue, >100 light brown, >1000 clear, >50 light green, 1 green, 10 dark green. The 9 "Natural Distillers" bottles mentioned above have D-1/54-50 on base and "Federal Law Forbids..." on shoulder, dating to 1934-64, most likely to 1950. A brown medicinal bottle with plastic cap has mark 7{OI}8/2S/10 dating to 1938 or 1948. A brown pint oval has mark D19/56 45 to left of recumbent {OI}. The plant dates from 1929-54, with a most likely date of 1945 for this bottle. A clear half pint oval has the "Federal Law..." mark, dating to 1934-64. A clear catsup bottle has a cursive "Duraglas" (1940-1963) and a base mark 20{O}5/2B/4064-E that likely further narrows the date to 1945. A clear square base is marked 4{O}9/18 dating to either 1929 or 1939. A clear gallon base marked 7{OI}2 dates to 1932 or 1952. Finally, a small cylindrical bottle marked 50-28/3{Anchor Hocking H over anchor}1 post-dates 1938.

12. Maximum Density-#/sq m (glass and ceramics): 50

*** 13. Tin Cans:**

Type	Opening	Size	Modified	Label/Mark	Function
1 Cone top		4 5/8 side, conical base			beer/soda
>100 Sanitary					mainly fruit/vegetables

Describe: Cone-top can dates to 1937 to 1966.

*** 14. Landscape and Constructed Features (locate on site map):**
Describe: Site is located on a terrace.

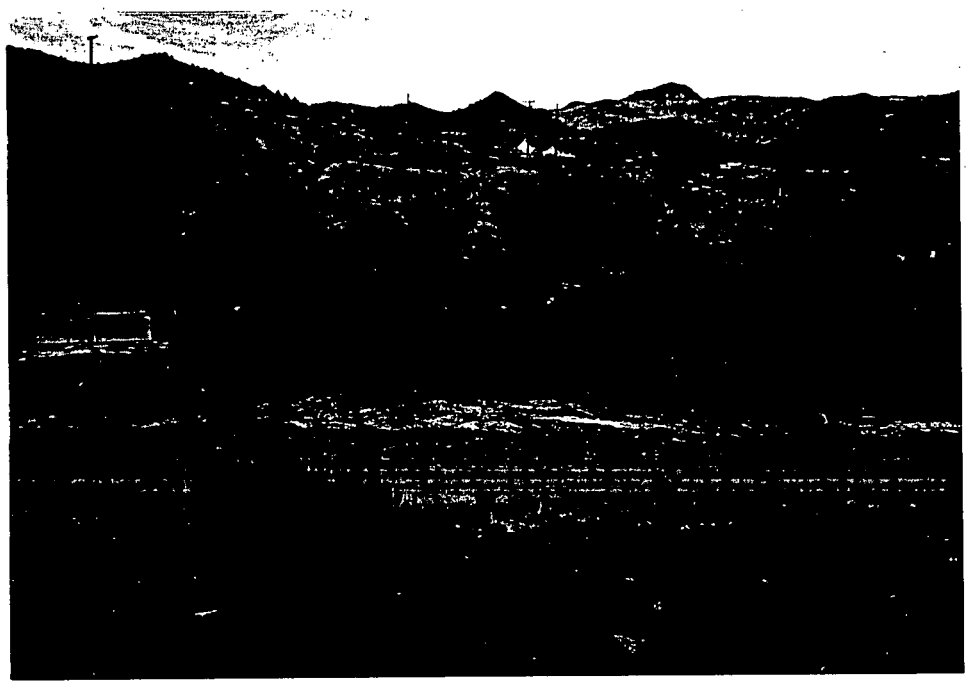
15. Buildings and Structures (locate on site map): None of historic age.

#	Material	Type	#	Material	Type

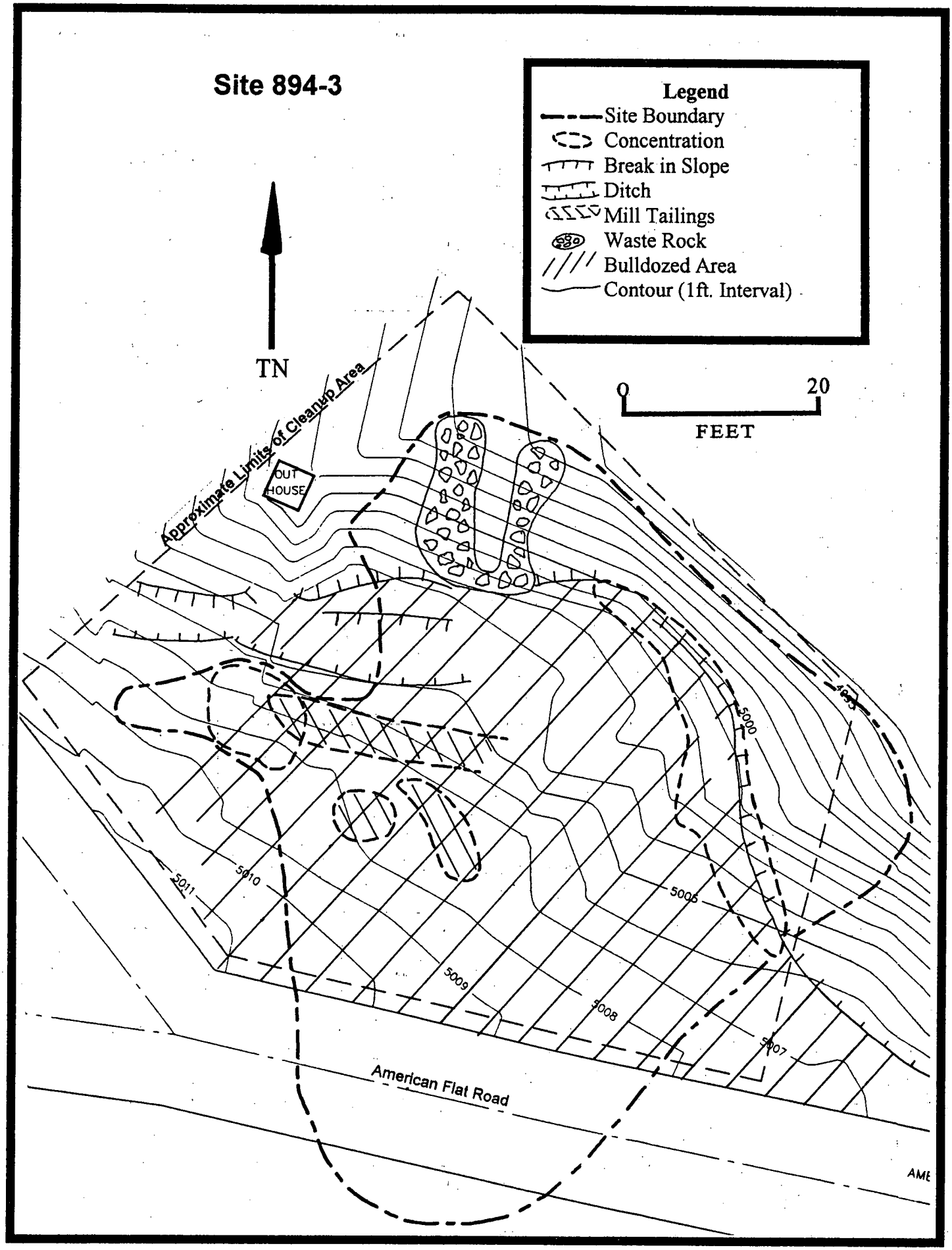
Describe:

16. Comments/Continuations: (Please make note of any Historic Record searches performed (for example - County Records, General Land Office, Historical Society, Land Management Agency Records, Oral Histories/Interviews) Records search at Nevada State Museum, Lyon County Courthouse, Nevada State Library, Nevada Historical Society, ARS files, Dayton Library.

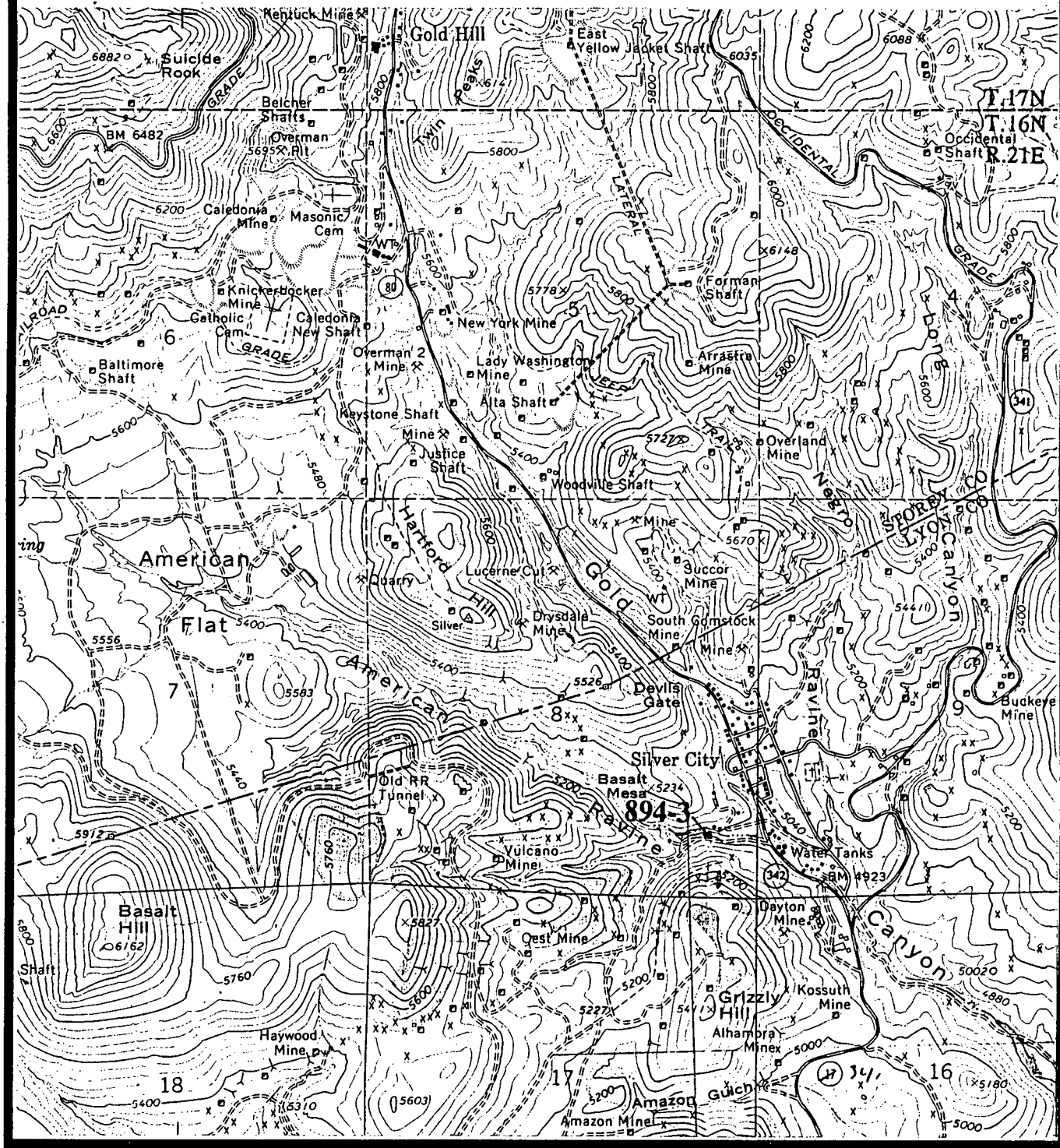
ARS Project No. 894, Site 894-3,
Carson River Mercury Project, Lyon County, Nevada



Roll ARCP 431, fr. 13, 11-4-96: Overview looking down on bench, 50°.


Site 894-3
Legend
Site Boundary
Concentration
Break in Slope
Ditch
Mill Tailings
Waste Rock
Bulldozed Area
Contour (1ft. Interval)
TN
0
20
FEET
Approximate Limits of Cleanup Area
OUT HOUSE
5011
5010
5009
5008
5007
5006
5005
5000
American Flat Road

Site Location Map



.0 .5 1.0mi

.0 .5 1.0 km

Archaeological Research Services, Inc.

Project No: ARS 894
County: Lyon
Map: Virginia City, Nev. 1967
Scale: 1:24,000

N

1990

IMACS ENCODING FORM

To be completed for each site form.
For instructions and codes, see IMACS Users Guide.

Encoder's Name D. Mathews
894-3

A

1 State Site Number

2 Agency Site Number

6 Agency Report Number

10 Elevation: Ø,5,Ø,Ø,Ø

11 Zone: 1,1 | Easting: 2,7,2,Ø,Ø,Ø | Northing: 4,3,4,8,8,8,Ø

12 | 1/4: NW | 1/4: SE | 1/4: SE | Sec.: Ø,8 | T.: 1,6 N | ft.: Ø,2,1 E

13 Meridian: 7

14 USGS Map: V,I,R,G,I,N,I,A, C,I,T,Y, 1,9,6,7

17 Owner: P,R

18 Forest | Dist./Park

19 Loc. Curated Materials

21 Cond.: D

22 Impacts: D,T

23 N.R.: D

26 Organ.: A,R

28 Survey Date: 1,1 - Ø,4 - 9,6

29 Slope: 1,Ø | Aspect: Ø,2,5

30 Water: distance/type: Ø,.,3 B

31 Geog. Unit: B,N,D

32 Topographic Location: 1st E | 2nd R

33 Dep.: D

34 Vegetation: E | 1 P | 2 P | 3 L

35 Misc. Text, Site Name

B

2 Culture/Dating Method

3 Area

4 Collect

5 Depth

6 Excav. Status

7 Prehistoric Artifacts

8 Lithic Tools: # / type

9 # | Flaking Stages

11 Ceramics: # / type

13 Features: # / type

14 Architecture: # / material / type

C

2 Historic Themes

3 Cultures / Dating Method

4 Dates: 1,8,7,Ø | 1,9,9,6

5 Area: Ø,Ø,5,3,Ø

6 Collect.: A

7 Depth: E

8 Excav. Status: C

9 Artifacts: G,L / M,E / N,C | NW / B,O / C,S | L,E / W,I / D,I

14 Features: # / type

15 Architecture: # / material / type

APPENDIX B:
FIELD CATALOG OF ARTIFACTS FROM EXCAVATION UNITS AND TRENCHES

APPENDIX C: HEALTH AND SAFETY PLAN

Archaeological Research Services, Inc. (ARS) Site Health and Safety Plan (HASP)
Carson River Mercury Site ARS Project No. 894
Preparers: Stephen R. Bloyd, CEM; Ronald L. Reno, Ph.D.
Projected Project Duration: October 29-November 9, 1996

1.0 INTRODUCTION

The objective of work is to conduct archaeological site recording and test excavations to determine the significance of historic archaeological sites at three locations at the Carson River Mercury Site (MS001 North, MS001 South, and MS030). From the point of view of health and safety considerations three distinct tasks will be performed by ARS personnel and subcontractors:

Task 1:	Non-ground-disturbing surface site recording.
Task 2:	Backhoe excavations.
Task 3:	Hand excavations and sifting of removed sediments.

This section of the Site Health and Safety Plan (HASP) defines general applicability and general responsibilities with respect to compliance with Health and Safety programs.

1.1 Scope and Applicability of the Site Health and Safety Plan

The purpose of this Site Health and Safety Plan is to define the requirements and designate protocols to be followed at the Site during investigation and remediation activities.

All personnel on site, contractors and subcontractors included, shall be informed of the site emergency response procedures and any potential fire, explosion, health, or safety hazards of the operation. This HASP summarizes those hazards in Section 3 and defines protective measures planned for the site. This plan must be reviewed and an agreement to comply with the requirements must be signed by all personnel prior to entering the exclusion zone or contamination reduction zone.

During development of this plan consideration was given to current safety standards as defined by EPA/OSHA/NIOSH, health effects and standards for known contaminants, and procedures designed to account for the potential for exposure to unknown substances. Specifically, the following reference sources have been consulted:

- (ACGIH) Threshold Limit Values
- OSHA 29 CFR 1910.120 and EPA 40 CFR 311
- U.S. EPA, OERR ERT Standard Operating Safety Guides
- NIOSH/OSHA/USCG/EPA Occ. Health and Safety Guidelines

1.2 Visitors

All visitors entering the contamination reduction zone and exclusion zone at the Site will be advised of potential for hazards. All visitors will be recorded in site log.

2.0 KEY PERSONNEL/IDENTIFICATION OF HEALTH AND SAFETY ROLES

2.1 Key Personnel

The ARS team includes Tom Burke, Ron Reno, Vickie Clay, and Larry Hause. Tennant Construction will provide a backhoe operator to be selected at a later date.

2.2 Site Specific Health and Safety Personnel

The Site Health and Safety Officer (HSO) is Ron Reno. Tom Burke is the designated alternate. The HSO has responsibility for ensuring that the provisions of this HASP are adequate and implemented in the field.

Stephen R. Bloyd, CEM (Bloyd & Associates) is the health and safety advisor for this project.

2.3 Organizational Responsibility

U.S. Environmental Protection Agency (EPA) in the capacity as Remedial Project Manager (RPM) will arrange for access to the three locations.

Patrick Ritter (E & E) is the primary contact between ARS and E & E regarding contractual matters and progress of work.

3.0 TASK/OPERATION SAFETY AND HEALTH RISK ANALYSIS

3.1 Historical Overview of Site

This HASP defines the hazards and methods to protect personnel from those hazards as identified in previous site work or background information. For a thorough overview of historical information concerning the Site see the preliminary assessments and site inspection reports by E & E and EPA.

3.2 Task by Task Risk Analysis

The evaluation of hazards is based upon the knowledge of site background and anticipated risks posed by the specific operation. The following subsections describe each task/operation in terms of the specific hazards associated with it. In addition, the protective measures to be implemented during completion of those operations are identified.

3.3 Task Hazard Descriptions

3.3.1. Task 1, Surface Recording

Hazards for this task are minimal, mainly confined to possibility of tripping and falling while moving about the site. Based on the E & E update of their HASP, chemical hazards are not a problem for this task.

3.3.2. Task 2, Backhoe Excavation

Hazards for the ARS crew include:

1. Contact with or inhalation of mercury contaminants identified on site by earlier studies. Mercury hazards are specified on the enclosed MSDS.
2. Back strain and muscle fatigue due to shoveling techniques.
3. Accidental collision with the backhoe.
4. Tripping and falling into trenches and on unstable backdirt piles.
5. Collapse of trench walls.

In addition to the first of these hazards, the backhoe operator must be alert for above-ground power lines. He/she will also be subjected to high noise levels.

3.3.3. Task 3, Hand Excavation and Sifting

Hazards for the ARS crew include hazards 1, 2, and 4 identified above.

3.4 Hazard Prevention

1. To minimize exposure to chemical contaminants, a thorough review of suspected contaminants was completed and an adequate protection program implemented. This program includes spraying sediments with water to reduce dust levels. If atmospheric dust from the excavations is present the crew will wear respirators with merc-sorb filters. The filters will be monitored frequently for color changes indicating need for a new filter. "SafeAir" personal exposure tags will also be worn. These tags provide an immediate visual signal if atmospheric mercury levels are approaching unacceptable levels (0.1/0.2 ppm/hr). If any crewperson's tag shows these levels all work will stop in the vicinity, the area will be sprinkled with water, and E & E will be consulted regarding installation of an air monitor and other appropriate measures in the area before work will continue. Proper PPE will be worn as detailed below. Respirators with merc-sorb filters will be worn by any crew members working in trenches or hand-dug units if work requires placing head below ground level.

2. Proper lifting techniques will prevent back strain. Use slow easy motions will be used when shoveling and digging to decrease muscle strain.

3. Personnel working near the backhoe will stay in eye-contact with the operator at all times when in reach of the bucket. If a person needs to venture within the working area of the bucket the bucket will first be grounded and the operator will signal awareness that a person is moving into the danger area. No personnel will occupy any position behind the backhoe. Hard hats will be worn by all personnel working in the vicinity of the backhoe.

4. Tripping and falling into open excavations or on unstable backdirt can be minimized by warning the crew to move slowly when wearing PPE. If excavation must remain open overnight they will be surrounded by orange plastic barrier fencing marked with standard "Danger Open Trench" signs. In addition to the barricades, wood covers will be placed over hand-dug excavation units lacking access ramps. During non-ground-disturbing site recording protective booties will not be worn over normal work boots to minimize danger of tripping and falling.

5. Collapse of trench walls will be minimized by not excavating trenches deeper than 4 feet. If necessary, trenches will be widened if walls are unstable. Steel toe boots will minimize danger to feet from stones falling from sidewalls. Hard hats will be worn in trenches over 3-feet deep. No one will venture into an excavation without another crew member in direct visual contact.

6. Ear protection will be worn by the backhoe operator.

7. An ARS crew member will be assigned to help the backhoe operator watch for overhead powerlines or other obstacles.

3.5 Health Hazards

Metallic Mercury is an odorless, silvery liquid metal. It is toxic by ingestion, absorption and inhalation of the fumes.

3.5.1 First Aid for Mercury:

If this chemical comes in contact with the eyes, immediately wash the eyes with large amounts of water, occasionally lifting the lower and upper lids. Get medical attention immediately. Contact lenses should not be worn when working with this chemical. If this chemical comes in contact with the skin, promptly wash the contaminated skin with soap and water. If this chemical penetrates through the clothing, promptly remove the clothing and wash the skin with soap and water. Get medical attention promptly. If a person breathes in large amounts of this chemical, move the exposed person to fresh air at once. If breathing has stopped, perform artificial respiration. Keep the affected person warm and at rest. Get medical attention as soon as possible. If this chemical has been swallowed, get medical attention immediately. (NIOSH, 1987)

4.0 PERSONNEL TRAINING REQUIREMENTS

Consistent with OSHA's 29 CFR 1910.120 regulation covering Hazardous Waste Operations and Emergency Response, all site personnel are required to be trained in accordance with the standard. At a minimum all personnel are required to be trained to recognize the hazards on-site, the provisions of this HASP, and the responsible personnel.

Prior to arrival on site, each employer will be responsible for certifying that his/her employees meet the requirements of preassignment training, consistent with OSHA 29 CFR 1910.120 paragraph (e)(3). The employer should be able to provide a document certifying that each general site worker has received 40 hours of instruction off the site.

All items listed in the final section on hazard communication will be discussed by the Site Supervisor and HSO at the site pre-entry briefing.

5.0 PERSONAL PROTECTIVE EQUIPMENT TO BE USED

Based on preliminary site assessments, Level D personal protective equipment (PPE) will be used.

General for all tasks:

1. Sturdy long-sleeved pants and shirt
2. Boots, leather, with steel toe and shank

In excavations and while handling sediments (Tasks 2 and 3):

3. Plastic-coated work gloves
4. Safety glasses

Near backhoe and in excavations over 3 ft deep (Task 2):

5. Hard hat

5.1 Chemical Resistance and Integrity of Protective Material

The following specific clothing materials will be used as part of Level D PPE at the site:

5.1.1. None for Task 1.

5.1.2. For excavations or other contacts with disturbed sediments (Tasks 2 and 3):

Inner Gloves - Surgical latex
Boots/Boot Covers - Tyvek
Outer Work Gloves - PVC
Outer Garment/Coveralls - Tyvek
Boots and gloves will be attached to the coveralls with Duct Tape
SafeAir Mercury badge

If liquid mercury is detected in an excavation the crew members in that area will immediately switch to Saranex coveralls and gauntlet-style heavy latex outer gloves. Velcro straps will be used to secure these items instead of duct tape to prevent damaging the protective coating.

5.2 SOP for Respiratory Protection Devices

Each person will be assigned their own respirator. It will be checked for fit before entering the field. Respirators will be cleaned daily with 2% Clorox solution. Respirators will be kept in sealed bags readily accessible at all times. Respirators will be worn at all times when dust is visible in the atmosphere or when working in the vicinity of liquid mercury.

5.3 SOP for Personal Protective Equipment

5.3.1 Inspection

PPE will be inspected upon receipt, upon issue to workers, after use and prior to maintenance, and if a question arises about its functioning. The user is the primary inspector of PPE.

5.3.2 Clothing Inspection Checklist

Before use:

- Determine that the clothing material is correct for the specified task at hand.
- Visually inspect for:
  - imperfect seams
  - non-uniform coatings
  - tears
  - malfunctioning closures
- If the product has been used previously, inspect inside and out for signs of chemical attack:
  - discoloration
  - swelling
  - stiffness

During the work task:

- Evidence of chemical attack such as discoloration, swelling, stiffening, and softening.

Keep in mind, however, that chemical permeation can occur without any visible effects.

- Closure failure.
- Tears.
- Punctures.
- Seam Discontinuities.

Gloves before use:

- Visually inspect for:

- imperfect seams
- tears
- non-uniform coating

6.0 MEDICAL SURVEILLANCE REQUIREMENTS

Medical monitoring programs are designed to track the physical condition of employees on a regular basis as well as survey preemployment or baseline conditions prior to potential exposures. The medical surveillance program is a part of each employers Health and Safety program.

6.1 Baseline or Preassignment Monitoring

Prior to being assigned to a hazardous or a potentially hazardous activity involving exposure to toxic materials each employee received a preassignment or baseline physical. The contents of the physical were determined by the employer's medical consultant. The preassignment physical categorized all listed employees as fit-for-duty and able to wear respiratory protection.

6.2 Exposure/Injury/Medical Support

As a follow-up to an injury or possible exposure above established exposure limits, all employees are entitled to and encouraged to seek medical attention and physical testing. Depending upon the type of exposure, it is critical to perform follow-up testing within 24-48 hours. It will be up to the employers medical consultant to advise the type of test required to accurately monitor for exposure effects.

6.3 Periodic Monitoring and Exit Physical

Due to the short duration of the project, periodic monitoring is not required beyond that provided by the personal SafeAir badges.

At termination of employment or reassignment to an activity or location which does not represent a risk of exposure to hazardous substances, an employee shall require an exit physical. If his/her last physical was within the last six months, the advising medical consultant has the right to determine adequacy and necessity of exit exam.

7.0 SITE CONTROL MEASURES

The buddy system will be used when workers are in excavations or wearing respiratory protection.

Due to the small size of the work area and low level of PPE, normal verbal communication is sufficient.

7.1 Work Zone Definition

The three general work zones established at the Site are as follows:

EXCLUSION (HOT) ZONE is where, because of ground-disturbing activity, contamination and trip-fall hazards are known to be present.

CONTAMINATION REDUCTION (WARM) ZONE is where workers and equipment is decontaminated.

SUPPORT (COLD) ZONE is located where the chance to encounter hazardous materials or conditions is minimal. PPE is put on in this area before entering the contamination reduction zone.

Location of all zones will be plotted on the SITE HASP MAP to be prepared on first entry to the site.

7.2 Nearest Medical Assistance

A map to the nearest medical facility (Carson-Tahoe Hospital) is included with this HASP.

8.0 SAFE WORK PRACTICES

Exclusion Zone:

- No smoking, eating, or drinking in this zone.
- No horse play.
- No matches or lighters in this zone.
- Check-in on entrance to this zone.
- Check-out on exit from this zone.
- Implement the communications system.
- Line of sight must be in position.
- Wear the appropriate level of protection as defined in the Safety Plan.

Contamination Reduction Zone:

- No smoking, eating, or drinking in this zone.
- No horse play.
- No matches or lighters in this zone.
- Wear the appropriate level of protection.

9.0 DECONTAMINATION PLAN

The levels of protection required for personnel assisting with decontamination will be Level D.

The HSO is responsible for monitoring decontamination procedures and determining their effectiveness.

Field equipment will be decontaminated by brushing and rinsing when needed.

All water solutions and dust from decontamination efforts will be returned to the excavation site.

9.1 Level D Decontamination Steps

Step 1 Brush off PPE before leaving Hot Zone.
Step 2 Remove outer garments (i.e., work gloves, coveralls and booties).
Step 3 Remove respirator.
Step 4 Remove inner gloves.
Step 5 Wash hands and face.

Due to low levels of contamination, disposable outer garments may be stored in the Warm Zone during breaks. At end of day, or when necessary, disposable garments and used paper towels will be disposed of in a lined and covered garbage can in the Warm Zone.

10.0 EMERGENCY RESPONSE/CONTINGENCY PLAN

10.1 Pre-Emergency Planning

During the site briefings all employees will be trained in and reminded of provisions of the emergency response plan, communication systems, and evacuation routes.

10.2 Personnel Roles and Lines of Authority

The Site Supervisor/HSO (Ron Reno with Tom Burke as alternate) has primary responsibility for responding to and correcting emergency situations.

10.3 Emergency Contact/Notification System

The following list provides names and telephone numbers for emergency contact personnel. In the event of a medical emergency, personnel will take direction from the HSO and notify the appropriate emergency organization.

Organization	Contact	Telephone
Central Lyon Co. Ambulance	LCSO	911
Lyon County Sheriff	LCSO	911
Central Lyon County Fire	LCSO	911
Carson Tahoe Hospital	ER	702/882-1361
Washoe Medical Center	ER	702/328-4140
Poison Control Center		702/328-4129
Regional EPA:	Cynthia Jones	415/777-2811
EPA Emergency Response Team		908-321-6660
State Authority:	NDEP	702/687-4270
National Response Center		800-424-8802
Center for Disease Control		404-488-4100
Chemtrec		800-424-9555

10.4 Emergency Medical Treatment Procedures

Any person who becomes ill or injured in the exclusion zone must be decontaminated to the maximum extent possible. If the patient's condition is serious, at least partial decontamination should be completed (i.e., removal of PPE.) First aid should be administered while awaiting an ambulance or paramedics. All injuries and illnesses must immediately be reported to the project manager.

Any person being transported to a clinic or hospital for treatment should take with them information on the chemical(s) they have been exposed to at the site. This information is included on the MSDS.

10.5 Emergency Equipment/Facilities

- o First aid kit
- o Fire extinguisher

All emergency equipment will be kept in the ARS vehicle.

11.0 HAZARD COMMUNICATION

In order to comply with 29 CFR 1910.1200, Hazard Communication, the following written Hazard Communication Program has been established. All employees will be briefed on this program, and have a written copy for review.

11.1 MSDS

Copies of MSDSs for all hazardous chemicals known or suspected on site will be maintained in the work area. MSDSs will be available to all employees for review during each work shift.

11.2 Employee Training and Information

Prior to starting work, each employee will attend a health and safety orientation and will receive information and training on the following:

(1) an overview of the requirements contained in the Hazard Communication Standard, 29 CFR 1910.1200;
(2) chemicals present in their workplace operations;
(3) location and availability of a written hazard program;
(4) physical and health effects of the hazardous chemicals;
(5) methods and observation techniques used to determine the presence or release of hazardous chemicals;

(6) how to lessen or prevent exposure to these hazardous chemicals through usage of control/work practices and personal protective equipment;
(7) emergency procedures to follow if they are exposed to these chemicals;
(8) how to read labels and review MSDSs to obtain appropriate hazard information;
(9) location of MSDS file and location of hazardous chemical list.

12.0 ATTACHMENTS

1. Site HASP Map
2. Decontamination Figure
3. Map to hospital
4. MSDS for mercury